University Students' Perceptions of Myocardial Infarction Patients

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DEDICATION

I lovingly dedicate my thesis work to my family and friends. A special feeling of gratitude to my parents, Henry and Liz, whose love and endless support have got me where I am today. A special thanks to my father, Henry, whose words of encouragement and push for tenacity ring in my ears. Thank you Dad for instilling the importance of hard work and higher education. Your patience and motivation have brought me where I am today and will continue to help me reach my dreams.

ABSTRACT

This study examined: (1) whether individuals who were described as having a myocardial infarction (MI) were perceived differently compared to individuals who were described as having rheumatoid arthritis or individuals who had no health condition; and (2) whether individuals described as engaging in exercise following an MI were perceived more positively than those described as not engaging in exercise following an MI or for whom no mention of exercise was made. University students (*n* = 473) were randomly assigned 1 of 10 target conditions. They completed demographic information, read a target description, created an image of that target in their head, and then rated that target on physical and personality characteristics. The results showed that the MI targets were perceived more negatively than the arthritis targets and healthy controls, specifically on the physical characteristics. Further, engaging in exercise following an MI helped to reduce the negative perceptions associated with MIs.

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CHAPTER ONE: LITERATURE REVIEW

1.1 Coronary Heart Disease

Coronary heart disease (CHD), coronary artery disease (CAD) and ischemic heart disease (IHD) are interchangeable terms in the medical literature for the chronic, progressive build-up of plaque in the major coronary arteries that most commonly results in unstable angina, myocardial infarction (MI) or cardiac arrhythmias (Rhee, Sabatine, & Lilly, 2002). CHD has been reported as the leading cause of death world-wide (Mackay & Mensah, 2004). The World Health Organization estimates that globally 3.8 million men and 3.4 million women die from CHD each year (Mackay & Mensah, 2004). The majority of these deaths were reported to be caused by a variety of cardiac complications including MI.

Although the results of complicated CHD can be life-threatening, preventing it is possible. Wulsin (2012) identified six major risk factors for CHD, three that are fixed (age, male gender and family history) and three that are considered modifiable (hypertension, hyperlipidemia and physical inactivity). Hypertension is diagnosed when an individual has abnormally high blood pressure that chronically strains the cardiovascular system (McArdle, Katch, & Katch, 2010). Hypertension can be mitigated by many interventions such as the reduction of sodium intake, engaging in physical activity, and stress reduction. Hyperlipidemia is described as an excess of lipids (low-density lipoproteins) in the bloodstream that can lead to blockages in the arteries. The primary preventative measure for hyperlipidemia is consuming a diet low in total fat, saturated fat, and cholesterol. Failure to meet the minimum guidelines for physical activity recommended by the Canadian Physical Activity Guidelines (Canadian Society

for Exercise Physiology, 2011) is the base measure for physical inactivity. Recommendations for adults, eighteen years or older, call for 150 minutes of moderate-to-vigorously intense aerobic physical activity per week in bouts of 10 minutes or more. Adults are also recommended to engage in strengthening activities of bone and major muscle groups two or more times a week.

Wulsin (2012) reported that these factors (i.e., hypertension, hyperlipidemia and physical inactivity) not only continue to be substantial health issues, but they are exacerbated by prolonged depression, anxiety, or chronic stress. If left untended, a CHD patient's psychological distress can expose him/her to a greater risk of further cardiac events.

1.1.1 Myocardial Infarction

One of the main outcomes of CHD is an MI, which is characterized by ischemia to the heart that results in irreversible death of heart muscle (Rhee et al., 2002). Myocardial ischemia occurs when blood flow to the heart is reduced and there is a lack of oxygen supplying the heart muscle. This myocardial ischemia can be caused by the acute blockage of a coronary artery that can occur during the natural course of coronary atherosclerosis - the growth of plaque in the coronary arteries (Rhee et al., 2002). Coronary atherosclerosis can lessen the integrity of the artery and cause perfusion to the myocardium to be impaired. If the plaque in the artery gradually enlarges to occlude the pathway of blood flow to the heart, it can result in an MI. An MI can also occur when plaque in the artery becomes complicated by a superimposed blood clot that fully obstructs the coronary artery (Rhee et al., 2002). The length of time that the blood supply

to the heart is blocked will determine the magnitude of damage to the heart and thus the resultant severity of the MI.

According to Statistics Canada (2011) there are an estimated 70,000 MIs annually in Canada, a figure that is steadily rising, and an estimated 16,000 resulting deaths. Putting this into another perspective, roughly one MI occurs in Canada every seven minutes. The medical management of MI patients has vastly improved over the last decades and has contributed to a striking decline in MI mortality rates. Approximately 77% of individuals survive their MI and are left to cope with the aftermath. As more patients survive their life-threatening MI, the recognition of outcomes other than mere survival, such as physical and psychological health, becomes more important.

1.1.2 Physical Health Outcomes following a Myocardial Infarction

Despite the improvement in post-MI prognosis, some individuals will sustain a considerable amount of cardiac damage following their MI. Large areas of scar tissue develop when the heart is deprived of oxygen for a sufficiently long period of time. This scar tissue no longer has the ability to contract, reducing the heart's ability to pump blood throughout the body. The amount of pumping ability lost depends on the size and location of the scar tissue. The severity of post-MI complications is very patient specific. It depends on a variety of factors such as the severity of CHD, other diseases and rehabilitation. Some patients may experience minor complications such as fatigue, shortness of breath and angina due to the artery remaining narrowed, while other patients may encounter more serious complications such as an aneurysm (swelling or bulging in the artery), congestive heart failure (the damaged heart is unable to function properly),

myocardial rupture (damage or rupture to the heart wall), or another MI (Wilansky, Moreno, & Lester, 2007). Although there are a variety of post-MI health complications that can arise, it is possible to not have any if proper lifestyle changes are adopted.

1.1.3 Psychological Health Outcomes following a Myocardial Infarction

Along with possible post-MI physical health complications, individuals may also experience psychological distresses such as depression, anxiety, negative self-image, and a negative social-image.

1.1.3.1 Depression and Anxiety

Symptoms of depression and anxiety have both been shown to occur post-MI (Frasure-Smith, Lesperance, & Talajic, 1995; Frasure-Smith, Lesperance, Juneau, Talajic, & Bourassa, 1999; Schleifer & Macari-Hinson, 1989). Stern, Pascale, and McLoone (1976) reported that patients who felt depressed or anxious shortly after their hospitalization remained so at subsequent follow-ups. Depression and anxiety have also been reported to increase the risk of further cardiac events (Frasure-Smith et al., 1995; Frasure Smith et al., 1999).

Although recent literature has concluded that depression and anxiety are related to the risk of further cardiac events in MI patients, depression has been shown to have the greatest impact (Frasure-Smith & Lesperance, 2003; Frasure-Smith, Lesperance, & Talajic, 1993; Wulsin, 2012). Fraser-Smith and colleagues (1993) showed that patients who were depressed one week following an MI were three to four times more likely to die in the ensuing six months than non-depressed MI patients. Lesperance, Frasure-Smith, Talajic, and Bourassa (2002) also found that the more depressed MI patients were at the time of hospital admission, the higher the five-year death rate. Current literature

thus suggests that post-MI depression is a predictor of higher mortality rates. It is becoming increasingly important for the health care system to focus on the psychological health of MI patients as a preventative measure for any further health risks. These findings support the notion that psychological factors play a role in post-MI prognosis and demonstrate that depression and anxiety need to be addressed in the treatment of MI patients.

1.1.3.2 Self-Image and Myocardial Infarction

Current literature suggests that when adults encounter a health threat like an MI, it can challenge their self-image of being physically competent and attractive individuals (Martin, Leary, & Rejeski, 2000). This can subsequently lead to decreased feelings of self-worth and increased feelings of depression (Martin, Leary, et al., 2000). Their self-image may also be negatively affected by changes in appearance (e.g., post-operative scars) and by how they believe others perceive them (Enskar & Bertero, 2010). If they feel that others are judging them negatively because of their health condition, they may in turn perceive themselves more negatively.

1.1.3.3 Social-Self and Myocardial Infarction

An MI may hinder an individual's perceived ability to fulfill social roles and care for him/herself (Hooyman & Kiyak, 1993), and can consequently cause the individual to feel that others are perceiving him/her in a negative light. For example, one qualitative study by Davison, Davey Smith, and Frankel (1991) investigated lay perceptions of coronary candidates in the general population. Davison and colleagues (1991) reported that people described coronary candidates as being fat, red-faced, overweight, inactive, smokers, and eating a fatty diet. This study also found that impressions formed of

coronary candidates incorporated some non-physical characteristics that were not directly attributable to the coronary condition itself, such as self-indulgence and a lack of self-control.

Stern and colleagues (1976) reported that MI patients ascribed their depressive symptoms to feeling damaged and less worthwhile, by both their own perceptions and those of others. This suggests that depressive symptoms may not only be caused by a lack of post-MI physical or functional improvements, but also in part by the negative feelings from how they sense they are perceived by others. Additionally Frasure-Smith and Lesperance (2003) found that MI patients' depressive symptoms may be associated with negative affectivity (negative emotions or neuroticism). The authors of this study suggested that negative affectivity is perhaps most associated with damaging health behaviours, and it is the remaining aspect of depression that has the strongest patho-physiological correlates. Coping with these negative feelings may be explained, in part, by the notion of self-presentation, in which people attempt to project socially desirable images to others.

1.2 Self-Presentation

Self-presentation, also referred to as impression management, is the process by which people attempt to monitor and control how they are perceived by others (Leary, 1992; Leary & Kowalski, 1990). People are generally concerned with the impressions that others form of them because they want to project a desirable social-image. This is done by emphasizing specific aspects of themselves that lead others to react favourably or by optimizing these desired impressions by simply omitting undesirable information about themselves that is likely to invite unfavourable reactions.

Individuals tend to self-present socially desirable images by emphasizing their positive characteristics rather than creating contrived images of themselves (Leary & Allen, 2011). People generally present themselves in line with their true self-image because they are concerned about their ability to sustain artificial impressions over time. People are also concerned about misrepresenting themselves through inauthentic image presentation because they worry that their deceit will be exposed and damage their perceived image. (Leary & Allen, 2011; Schlenker, 1985). The process of trying to make oneself look more favourable in others' eyes is defined as self-presentation.

There are many reasons why individuals are motivated to self-present to others. According to Leary (1995), individuals self-present for three reasons: for interpersonal influence, to enhance the construction of a personal identity, and to elicit positive emotions.

Firstly, people may self-present for interpersonal influence in order to gain socio-cultural benefits such as employment, friendship and romance. Some people believe that behaving in strategic ways to project desired social impressions will determine their outcomes in life (Leary & Allen, 2011). These beliefs are often true, as the impressions that people make on others are a primary determinant of their outcomes in life. For instance, when people are perceived more positively they tend to have more friends and obtain greater monetary gains (Leary, 1992). On the other hand, people believe that self-presentational failures can result in a loss of social, materialistic or financial advancement (Leary, 1995). Therefore, people will influence others to respond to them in desired ways by projecting favourable information about themselves. For instance, people may laugh at

a joke told by their boss (even when they do not think it is funny) in order to appear interested and friendly.

The second reason for self-presenting is for the construction and maintenance of a personal identity. Acquiring a particular identity often requires individuals to behave in ways that are consistent with that identity (Leary, 1995). A new police officer, for example, will act in accordance with the expectations associated with being a police officer in order to solidify his or her new identity. Once the officer is perceived by others as having the characteristics germane to police officers, it will reinforce that person's belief that he or she actually possesses those traits. One's self-presentation is thus validated when it is matched by others' impression formations.

The third reason for self-presenting is to elicit positive emotions and mitigate negative emotions. People may be motivated to impression-manage to improve how they feel by behaving in ways that obtain approval and acceptance (Leary, 1995). Feelings of approval and acceptance ultimately lead to more positive feelings about oneself, such as higher self-esteem, and more positive status.

Given the benefits garnered from making desired impressions, it is understandable why individuals are motivated and invested in ensuring that they continuously project a desirable image. That desirable image, however, is not one static, positive image tailored for all audiences. Images are oftentimes conveyed to be specifically desirable to a specific person or audience (Baumeister, 1982; Leary, 1995). For instance, if one is pursuing a career as a border guard, an attempt to project an image relevant to that role (e.g., aggressive) may be perceived favourably by a potential employer, but it may not be the image one desires to project to others (e.g., family).

1.2.1 The Two-Component Model of Self-Presentation

Research suggests that self-presentation involves not only one's motivation to manage the impressions others form, but also the effort to actually create and maintain these impressions (Schlenker, 1985; Greenwald & Breckler, 1985). Leary and Kowalski (1990) suggested a separation of these processes into a two-component model that distinguishes between the discrete processes of impression motivation and impression construction.

1.2.1.1 Impression Motivation

Impression motivation is the process by which individuals are motivated to manage their social impressions (Leary & Kowalski, 1990). The degree to which one is motivated to manage his/her image depends on such factors as the goal-relevance of the impression, the value of the desired goals, and the discrepancy between the individual's current and desired images (Leary & Kowalaski, 1990). To elaborate, individuals are motivated to manage how others perceive them when the outcome can result in the fulfillment of goals (e.g., social, monetary, identity development). The extent of this motivation is rooted in the value that the individual places on those desired goals. For example, one will be motivated to manage impressions in a job interview if the job is considered highly desirable. Additionally, the discrepancy between one's desired image and one's current image affects one's motivation to manage impressions. Thus, the farther removed the desired image is from the current one, the greater the motivation to manage impressions.

1.2.1.2 Impression Construction

Impression construction involves not only the process of establishing which impression one wishes to make, but also choosing the approach taken to portray the impression (Leary & Kowalski, 1990). According to Leary and Kowalski (1990), there are five factors that influence how individuals attempt to construct images of themselves. Self-concept is the first factor that plays a role in the impressions people try to project. People will reveal aspects of themselves that they value and believe are representative of who they are. The second factor involves desired and undesired social-images. This means that individuals strive to manage their impressions in ways that are consistent with their desired images and contrary to undesired images. The third factor, role constraints, proposes that individuals act in ways that ensure they are carrying out their expected roles. Those in role-governed situations manage their impressions based on a prototype-matching process (e.g., fireman, teacher; Leary 1989). For example, from the moment that someone starts training to become a police officer, he/she will present an impression that reflects the demeanour of the prototypical police officer role. The fourth factor, target values, suggests that people modify the impressions they attempt to portray according to the preferences of whomever they are attempting to impress (e.g., significant other). The fifth and last factor is the gap between how people think they are currently perceived and how they think others might perceive them in the future.

1.2.2 Self-Presentational Tactics

Once motivated to create a specific impression, one has to determine how to make that impression. When making these decisions, there are many tactics a person can utilize

to convey a particular impression (Leary, 1995). One self-presentational tactic is the use of verbal cues, such as informing others in a conversation about one's likes and dislikes, accomplishments, family, and personality, to create a particular impression. Attitudes that are verbally expressed can also influence impressions formed by others. To illustrate, if a woman claims that she does not like children, it is likely that one will form impressions of her based on an extrapolation of other characteristics from this attitude. In addition to verbal cues, non-verbal cues can also be used as a self-presentational tactic. For example, attitudes can be conveyed through facial expressions and actions (e.g., smiling, giving a thumbs up). Even when one is unhappy, a smile can convey a positive impression. Physical appearance is another non-verbal tactic that can affect impressions. The inclination to buy fashionable clothing or spend lavishly on professional hair care stems in part from a desire to project an image that meets approval from others. If one truly did not care about outward appearance, there would be less motivation to spend time and money on physical appearance. Behaviours can also be used as a self-presentational tactic. For example, many adolescents may use smoking as a means of presenting a cooler or more mature image (Leary, Tchividiian, & Kraxberger, 1994). Exercise may be used in a similar manner to present a physically active and healthy image to others (Leary, 1992).

1.3 Impression Formation

Impression formation is the process by which individuals form their impressions of other people. Individuals not only tend to form impressions of people when first meeting them, but they also have a tendency to continue forming those impressions throughout their interactions. The judgement made of others during an initial encounter

can influence the course and outcomes of future interactions (Greenlees, Buscombe, Holder, & Rimmer, 2005). Mutual impressions are formed from sparse information when people meet for the first time (Smith & Mackie, 2007). Initial impressions are often geared towards making judgments on physical appearance (e.g., physical features, clothing) and behaviours (e.g., holding a door open). Impressions become more fully formed as contact between people continues. Determining through interaction and behaviours whether one likes someone will partially determine if and how often further associations with this person will take place and whether a positive or negative impression is formed of this person.

When forming impressions of others it is very common to make stereotypical judgments. This is because of the tendency to expediently categorize others rather than developing an impression based on a more detailed observation of individual characteristics (Smith & Mackie, 2007). When categorizing someone, one makes social judgements about that person in line with the descriptive characteristics of that category (e.g., a blonde female being seen as unintelligent). By not categorizing someone and making ungrounded judgements, a more accurate perception can be developed when assimilating insightful fragments of information about that person (Smith & Mackie, 2007).

There are important implications associated with impression formation. The impressions that are formed of people can affect their social, psychological and financial outcomes. For instance, if someone is perceived as lazy, self-indulgent, overweight, lacking self-control and having few friends, it is likely that he/she will reap fewer socio-culture benefits (e.g. employment or friends) than those to whom the opposite

characteristics have been ascribed. There are also self-presentational costs associated with less favourable perceptions, such as job loss or losing friends (Leary, 1995). Research has found that impressions that people make on others can influence how others perceive, evaluate, and treat them, and can influence their psychological well-being (Leary, 1992). If someone creates a negative impression, the treatment from others in terms of, for example, social acceptance and kindness, is likely to differ from that of someone perceived more positively. Being perceived more negatively may therefore engender feelings of social anxiety and other negative emotions (Leary & Kowalski, 1995).

1.3.1 Impressions of Special Populations

Impression formation not only has important implications for the healthy, able-bodied population but also for special populations such as the elderly, the physically disabled and those with cancer. Special populations may actually be at greater risk of negative impression formation stemming from incorrect assumptions and stereotypes, such as the physically disabled being incorrectly perceived as cognitively impaired.

1.3.1.1 Impressions of Older Populations

Older adults are no less concerned with impression formation than younger ones. A meta-analysis by Kite, Stockdale, Whitley, and Johnson (2005) reported that attitudes towards older adults are actually more negative than younger adults. This is likely because people tend to characterize older adults as being incompetent, unattractive, in poor health, and asexual (Gerike, 1990). Characteristics of incompetence and unattractiveness have commonly emerged in older adult stereotypes (Kite et al., 2005). For example, Kite and Johnson (1988) found a large bias against older adults when

competence was assessed, reflecting the belief that competence declines with age. Competence is considered a valuable characteristic in older adults because it demonstrates their ability to fulfill their social roles and care for themselves. Physical attractiveness is also a component of stereotypic beliefs of older adults. According to literature examining aging stereotypes, people perceive a decline in attractiveness with age (Deutsch, Zalenski, & Clark, 1986). It therefore appears that older adults are generally perceived less favourably than younger ones.

1.3.1.2 Impressions of Individuals with Health Conditions

Researchers have also investigated the impressions formed of special populations such as those with a physical disability, Parkinson's disease, cancer and CHD (Arbour, Latimer, Martin Ginis, & Jung, 2007; Martin, Leary, et al., 2000; Miller & Cordova, 2002; Katz et al., 1987; Davison et al., 1991). According to this literature, individuals with physical disabilities often receive negative judgements from others (Arbour et al., 2007; Miller & Cordova, 2002). Miller and Cordova (2002) reported that attitudes towards those with disabilities are often negative. This study reported that one of the greatest difficulties to overcome for those with a disability is not the disability itself, but rather the lack of acceptance by others. The perceptions of those with a physical disability have been reported as being negative, simplistic and discriminative (Miller & Cordova, 2002). These negative attitudes towards those with a physical disability can pose significant social barriers.

Martin, Leary, and colleagues (2000), in their review of self-presentation in older adults and health behaviours, reported that individuals with Parkinson's disease (PD)

were the subjects of negative judgments. PD patients typically experience a resting tremor and bradykinesia, but not typically a decrease in cognitive function. Although PD does not directly affect cognitive function, the lay perception of PD sufferers is likely to incorrectly associate the individual's appearance (slow movements and tremors) with impaired cognitive function (Martin, Leary, et al., 2000). In addition, PD patients experience a loss of muscle function that makes constructing emotional facial expressions more difficult (Martin, Leary, et al., 2000), which can lead people to incorrectly form the impression that these individuals are despondent or lack emotion. PD patients may consequently experience negative emotions from being perceived as cognitively impaired by the general population.

Research has also investigated negative attitudes towards those with cancer. An early study by Katz and colleagues (1987) reported that cancer patients are evaluated less favourably and are eschewed more than those with other health conditions. This study investigated perceptions of individuals with cancer, diabetes, AIDS and CHD. Results indicated that individuals with each of these four conditions were perceived less favourably compared to those who were not ill, on characteristics of competence, dependence, depression, moral worth and morbidity. It was determined that college students, hospital nurses, medical students, and chiropractic students perceived cancer patients as being both physically and psychologically impaired. They were also described as being less competent, more dependent, depressed, and sicker when compared to other illnesses (Katz et al., 1987). This study also found that individuals with diabetes were perceived most favourably on all five characteristics (competence, dependence,

depression, moral worth and morbidity) compared to individuals with CHD, cancer or AIDS.

Attitudes towards individuals with AIDS have also been shown to be quite negative (Katz et al., 1987). Katz and colleagues (1987) found that AIDS patients were perceived as less competent and less morally worthy than the other three health-conditions or the control group. They were also shown to be the most socially rejected and were held responsible for their illness. This study demonstrated that not only university-aged participants rated those with AIDS more negatively, but nurses, medical students, and chiropractic students did as well. Therefore, these studies demonstrate that a variety of impressions are formed for various health conditions.

Existing literature has also demonstrated that individuals with CHD are perceived negatively compared to the healthy population. Davison and colleagues (1991) reported that people generally perceive CHD patients in a negative light (e.g., overweight, inactive, smokers). Similarly, Katz and colleagues (1987) found that CHD patients were rated less favourably on a variety of dimensions (e.g., competence, dependence, depression, and moral worth) when compared to a healthy population. However, these studies were conducted over two decades ago and with the medical advancements in CHD diagnosis and treatment and the potentially greater public awareness of CHD, further research should be conducted to ascertain whether these perceptions have changed since then.

There is no literature to date that specifically examines the impressions that people form of MI patients, but using literature that has determined attitudes towards

other special populations (i.e., CHD) allows us to draw some inferences. Health conditions such as an MI may impair an individual's ability to perform everyday activities or meet role demands, since they are typically instructed to rest and refrain from activities that are considered physically demanding. Gerike (1990) indirectly suggested that health conditions, such as an MI, can interfere with an older adult's ability to convey an image of competence, happiness, vitality, attractiveness, sexuality, and good health. Determining how people currently perceive MI patients will allow us to ascertain the stereotypes that may exist towards this population.

There are several factors other than health status that can influence impression formation. Impression formation is shaped by such factors as the individual's behaviour, profession, gender, ethnicity, goals, vocabulary, clothing, body language, exercise status, and physical appearance (Kunda & Thagard, 1996). In order to convey favourable images, people will emphasize certain information about themselves that is seen as more attractive or likable (Martin, Leary, et al., 2000) and engage in certain behaviours that they believe others will perceive more favourably. For instance, recent literature has investigated the benefits of conveying information about one's exercise habit as a self-presentational tactic (Arbour et al., 2007; Drouin, Varga, & Gammage, 2008; Greenlees, Webb, Hall, & Manley, 2007; Hodgins, 1992; Lindwall & Martin Ginis, 2006; Martin Ginis, Latimer, & Jung, 2003; Martin Ginis & Leary, 2006; Martin Ginis & Leary, 2010; Martin, Sinden, & Fleming, 2000; Shields, Brawley, & Martin Ginis, 2007).

1.3.2 Exercise and Impression Formation

Most studies investigating perceptions of exercisers have employed similar procedures. These studies give participants (evaluators) a standard paragraph that describes an individual (target) on a variety of characteristics, such as physical appearance, occupation, family, and hobbies. Certain key characteristics embedded in the paragraph are then varied in different versions of the target descriptions. Gender and exercise status (exerciser/non-exerciser/control), for example, are the two most commonly used characteristics (Arbour et al., 2007; Lindwall & Martin Ginis, 2010; Martin Ginis et al., 2003; Martin Ginis & Leary, 2006; Martin, Sinden, et al., 2000). After reading the paragraph, the participant is asked to create a vivid image of the target in his/her mind and then rate the target on a variety of personality (e.g., mean/kind, dependent/independent) and physical (e.g., unfit/fit, physically sickly/physically healthy) characteristics. These characteristics are rated on a 9-point semantic differential scale such that opposing word pairs are anchored at either end of the scale (e.g., 1 = mean, 9 = kind).

Several studies have shown that exercise has self-presentational benefits. Hodgins (1992) found that males and females who were described as being physically active were rated more favourably on a variety of personality dimensions (e.g., self-confidence, sociability, independence) when compared to sedentary individuals. A study by Martin, Sinden, and colleagues (2000) found that targets (male and female) described as exercisers were rated more favourably than non-exercisers on almost all of the measured attributes (personality and physical characteristics). Exercisers were also rated

more favourably than controls on almost half of the attributes. Results of this study showed that exercisers were perceived more positively on physical attributes - they were seen as being fitter, healthier, more muscular, and more physically attractive than both non-exercisers and controls (those for whom no exercise habits were mentioned). The self-presentational benefits of being an exerciser also extended to a variety of personality characteristics, with exercisers being seen as more confident, in control, and hard-working than both non-exercisers and controls (Martin, Sinden, et al., 2000). Exercisers were also perceived more favourably than non-exercising targets on characteristics of intelligence, sociability, neatness, happiness, friendliness, independence, braveness, and number of friends. These studies indicate that exercisers were perceived positively on a variety of personality and physical characteristics by people in North America.

Lindwall and Martin Ginis (2006) were interested in extending this research using a Swedish population. They concluded that Swedish university students rated female targets who were described as exercisers more favourably on both physical and personality characteristics (although more so on the physical characteristics) than non-exercisers and controls. Therefore, all of these studies have concluded that exercisers are perceived more favourably on a variety of personality and physical dimensions than non-exercisers and controls (Hodgins, 1992; Lindwall & Martin Ginis, 2006; Martin, Sinden, et al., 2000). These results emerged for all targets who were described as exercisers, regardless of age or gender. The positive impressions formed of those who exercise has been termed the *positive exerciser stereotype.* The positive exerciser stereotype posits that exercisers are not only accorded positive qualities that are directly attributable to exercise, such as physical fitness or slimness, but also inferred ones that create an

exerciser aura such as the perception of being happier and friendlier. As a result, those deemed to fit the exerciser stereotype are more likely to reap social, romantic and financial benefits because of these positive traits.

Despite the emerging evidence suggesting that exercise yields significant self-presentational benefits, research by Martin, Sinden, and colleagues (2000) also demonstrated that there are also self-presentational liabilities for those who are described as non-exercisers. This study found that individuals described as non-exercisers not only received poorer ratings than exercising targets, but also the control targets. The negative impressions formed of those who are non-exercisers have been termed the *negative non-exerciser stereotype*. Self-presentational liabilities associated with being a non-exerciser include being perceived as more unhealthy, having a less attractive figure, being more afraid, lacking confidence, and lacking self-control (Martin, Sinden, et al., 2000). Perceived less favourably, these individuals are less likely to reap the benefits that exercisers are privy to.

Although the exerciser and non-exerciser stereotypes have emerged for female targets, few studies have examined if these stereotypes extend to male targets. Even though some research has found that the target's gender does not moderate the effects of exercise information on impression formation (Hodgins et al., 1992; Martin, Sinden, et al., 2000), other research has argued that target gender has been relatively ignored. Investigating the exerciser stereotype for men is important because research has shown the existence of different societal expectations and ideals associated with the body for men and women (Cash & Smolak, 2011). Lindwall and Martin Ginis (2010) investigated

the exerciser and non-exerciser stereotypes on male targets using Swedish undergraduate students. The participants in this study were asked to read one description of a male target who was either described as a typical exerciser, an active living target, an excessive exerciser, a non-exerciser, or a control target. They were then asked to rate the male target on physical and personality characteristics. The results of this study showed that both the positive exerciser stereotype and negative non-exerciser stereotype emerged for male targets. The typical exerciser, the active living target, and the excessive targets received more positive ratings than the non-exerciser targets and the control targets on physical and personality characteristics. The results of this study also showed that the non-exerciser target was rated less favourably when compared to the control target.

Overall, these studies have found that impression formation can be affected by many factors such as those related to the evaluator, to the target, and to exercise itself. Factors related to the evaluator that can affect impression formation include the evaluator's self-described exercise status, gender and age. Factors related to the target that can affect impression formation include the target's gender, age, weight status, and whether or not the target has an eating disorder. The intensity and type of exercise that the target is described as engaging in are exercise-related factors that can also influence impression formation.

1.3.2.1 Factors Related to the Evaluator and Impression Formation

There are many factors related to the evaluator (the person/participant making judgments) that can affect impression formation, including the evaluator's exercise status, gender, and age.

1.3.2.1.1 Evaluator's Self-Described Exercise Status and Impression Formation

Research has indicated that individuals tend to perceive other people more favourably when they possess similar qualities (Lindwall & Martin Ginis, 2006; Tajfel & Turner, 1979). Researchers have attempted to determine whether one's self-classified exercise status impacts the perception of other exercisers. Martin Ginis and colleagues (2003) found some support for the moderating effects of one's self-classified exercise status. This study found that self-described exercisers rated a typical exerciser and an excessive exerciser more favourably on three physical dimensions than they rated other targets (active-living, non-exerciser, and control targets). This may suggest that self-classified exercisers consider active-living targets to be pseudo-exercisers (Martin Ginis et al., 2003). Although the effect size was fairly large for the multivariate interaction ($\omega^2 = 0.14$), these results provide only minimal support for the effects of self-classified exercise status since only three significant physical dimensions emerged. This suggested a small positive bias towards exercisers. Although evidence from this study was limited, it was concluded that the exerciser stereotype emerged regardless of the participants' self-classified exercise status.

Faulkner, Simone, Irving, and Martin Ginis (2007) were also interested in determining if a younger adult's (evaluators) self-classified exercise status would influence the impressions they formed of older adults (70 years old) who were described as exercisers. The results of this study showed that the participant's self-classified exercise status did not influence the impressions formed of exercising older adults. This study found that the exerciser stereotype emerged regardless of the evaluators' self-

classified exercise status. Therefore, the young adult participants who classified themselves as exercisers were not biased towards older adult exercising target.

To expand on this research, Lindwall and Martin Ginis (2006) were interested in determining if someone's motivation to be seen as an exerciser moderated the impressions formed of female exercising targets in a Swedish sample. This motivation is otherwise known as impression motivation (Leary & Kowalski, 1990), where people are motivated to control how others see them. As previously mentioned, impression motivation is associated with the desire to create particular impressions in others' minds. Lindwall and Martin Ginis (2006) found that Swedish undergraduates' who had high impression motivation to present themselves as exercisers perceived other exercisers (typical and excessive exercisers) more favourably on 3/10 physical characteristics, but not their personality ratings. Similar to Martin Ginis and colleagues (2003), this study found a positive bias towards exercisers in the typical and excessive target exerciser groups on physical characteristics (but not personality characteristics), but not towards the active living target (i.e., choosing the stairs instead of elevator) group. Lindwall and Martin Ginis (2006) suggested that those who strongly value exercise do not perceive active living targets more positively because they are seen as pseudo-exercisers. Based on these findings, Lindwall and Martin Ginis (2010) decided to replicate this study using a male target. Similar to Lindwall and Martin Ginis (2006), this study examined the moderating effects of impression motivation of female and male Swedish undergraduate students on impressions formed of a male exercising target. The results of this study found that participants who scored high on impression motivation rated the active living and exercising targets more favourably than the non-exercising and control targets,

compared to the participants who scored low on impression motivation, but only on the physical characteristics. Therefore, both Lindwall and Martin Ginis (2006) and Lindwall and Martin Ginis (2010) found that those with high impression motivation have a positive bias for other exercisers on physical characteristics. Lindwall and Martin Ginis (2006) found a positive bias for the ratings scrawny/muscular, sick/healthy, and unattractive figure/attractive figure, and Lindwall and Martin Ginis (2010) found a positive bias for the ratings unfit/fit, physically weak/physically strong, and unattractive physique/attractive physique. Although these studies reported that the positive exerciser stereotype was evident among participants who themselves were motivated to present themselves as exerciser, it was only evident among three ratings. Therefore, there is a small amount of evidence to support the idea that exercisers or those who are motivated to exercise perceive other exercisers more positively.

1.3.2.1.2 Evaluator's Gender and Impression Formation

The vast majority of studies have shown that there is no effect of the evaluator's gender on the impressions formed of exercisers compared to non-exercisers (Arbour et al., 2007; Greenlees et al., 2007; Kite et al., 2005; Lindwall & Martin Ginis, 2006; Martin Ginis et al., 2003). However, few studies have shown otherwise (Martin Ginis & Leary, 2006; Shields et al., 2007). Shields and colleagues (2007) examined whether men and women differed in their impression formation of men based on exercise status. This study found that male evaluators rated non-exercising targets more negatively compared to the exercise targets than female evaluators. Male evaluators were also found to rate the control target (where no exercise habits were mentioned) as being significantly less fit

compared to the exercising target than the female evaluators. Overall this study concluded that female evaluators judged the male exerciser target less harshly than the male evaluators (Shields et al., 2007). Similarly, Martin Ginis and Leary (2006) found that exercise status had a greater influence on women's impressions of other women than men's impressions of the same women. The results of Martin Ginis and Leary (2006) indicate that gender may have a greater impact on impression formation when the evaluator and the target are of the same gender.

1.3.2.1.3 Evaluator's Age and Impression Formation

The majority of studies looking at impressions formed of younger adult exercisers have found no influence of the evaluator's age on impression formation (Kite et al., 2005; Lindwall & Martin Ginis, 2006; Martin, Sinden, et al., 2000; Martin Ginis et al., 2003). However, the age of the evaluator has been found to influence impression formation of older target populations. A study by Greenlees and colleagues (2007) examined the moderating effect of the participant's age. This study investigated the perceptions that evaluators, who were split into three age groups (16-25 years old, 26-55 years old, and 56+ years old), formed of three older adult (65 years old) targets - those described as either engaging in exercise, not engaging in exercise and those where no mention of exercise status was made (controls). The results of this study yielded a significant main effect for the participant's age. Older adult participants (evaluators) were found to rate the older adult targets as more sexually attractive, better looking, and younger looking than either the middle-aged or young adult participants/evaluators. It was also determined that older adult participants rated the older adult target as being happier and having better

memories than the youngest participants. There was, however, no interaction between the participant's age and the target's exercise status and therefore no impact of participant age on exercise status. This study suggests that the benefits of exercise for older adults were seen across all participant age groups. Therefore, age of the evaluator can influence impression formation in older targets, but the impact on target's exercise status requires further investigation.

1.3.2.2 Factors Related to the Target and Impression Formation

Factors such as the target's gender, age, weight status, and eating disorder status have emerged as potential impression formation moderators.

1.3.2.2.1 Target's Gender and Impression Formation

There is conflicting research evidence as to whether target gender influences impression formation. The majority of studies investigating the impressions formed of exercisers have suggested that the target's gender does not influence impression formation based on exercise habit information (Hodgins, 1992; Martin, Sinden, et al., 2000; Martin Ginis et al., 2003). Martin, Sinden, and colleagues (2000), for example, investigated whether information about an individual's exercise habits influenced impressions formed of male and female targets. Results demonstrated that both male and female targets described as exercisers were perceived more favourably than non-exercisers and controls. Therefore, target gender did not influence the effects of exercise-habit information.

A meta-analysis by Kite and colleagues (2005) argued that target gender has been relatively ignored in the literature examining attitude formation and recommended the inclusion of this variable in future research. As a result, Greenlees and colleagues (2007) investigated the impressions that people (young, middle, and older-aged individuals) formed of older female and male targets who were described as engaging in exercise. This study suggested that female targets were rated more positively on six out of 13 physical appearance characteristics than males, but no differences were found for the personality characteristics. The results of this study suggest that gender should be included and manipulated in researching potential stereotypes of older adults. Additionally, Arbour and colleagues (2007) found that women with a physical disability (e.g., spinal cord injury) were perceived more negatively than men with a physical disability. This study found that through exercise, physically disabled women were able to create positive impressions to an extent that they were evaluated equivalent to men with physical disabilities (Arbour et al., 2007). This may suggest that individuals tend to form gender-specific beliefs in special populations. Therefore, including the target's gender may be an important factor for research examining impression formation of older adults and special populations.

1.3.2.2.2 Target's Age and Impression Formation

Kite and colleagues (1988) conducted a meta-analysis investigating the attitudes held towards older and younger targets. This study concluded that older adults were generally perceived more negatively when compared to younger adults. In terms of the self-presentational benefits of exercise, studies have yet to directly examine the

differences between impressions of younger exercisers and older exercisers. Current literature suggests that older exercisers experience self-presentational benefits similar to those afforded to younger adult exercisers (Greenlees et al., 2007; Kite et al., 1988; Martin, Leary, et al., 2000). Greenlees and colleagues (2007) showed that although older adults may initially be perceived negatively, subsequently providing information such as exercise habits can help form a more positive perception. Of interest is that Greenlees and colleagues (2007) found stronger evidence of a positive exerciser stereotype for older adult targets than younger ones. Specifically, they found more positive perceptions of older adults on 6/13 personality characteristics, whereas the majority of previous research on younger adult exercisers (Martin et al., 2000; Martin Ginis et al., 2003) has only found an average of 2/12 personality characteristics rated more positively for exercisers. This study indirectly suggests that the age of the target influences the impressions that are formed.

A study by Faulkner and colleagues (2007) also examined impressions that are formed of older adult exercisers. The results of this study showed that older adults described as engaging in exercise were rated more favourably than those described as non-exercisers on a variety of personality and physical dimensions. Consistent with Greenlees and colleagues (2007), the positive stereotype associated with people who exercise extended to older adults. It appears on the whole that the benefits of being perceived more positively as an exerciser (e.g., social, financial) extend across all ages, but the benefits may be greater for certain age groups.

1.3.2.2.3 Target's Body Weight and Impression Formation

Being overweight is associated with a variety of unfavourable characteristics, such as laziness, ill health, unattractiveness, and low intelligence (Crandall, 1994). These negative stereotypes are derived from the false assumptions that overweight people lack the effort to diet and exercise (Crandall, 1994). Martin Ginis and Leary (2006) investigated whether information about a woman's body weight moderated the effects of information about her exercise habits (exerciser, non-exerciser, and control) on the ratings of her personality and physical appearance. The target's body weight was categorized into three different body weight groups - underweight, average weight, overweight. Results of this study demonstrated that information about a woman's body weight interacted with exercise information to significantly affect evaluations of physical appearance. Interestingly, this study found that overweight exercisers were considered just as physically attractive as all three underweight targets (exerciser, non-exerciser and control) and two of the average weight targets (non-exerciser and control). Results of this study also indicated that overweight non-exercisers were considered less physically attractive than underweight non-exercisers; the underweight non-exercisers were not affected by the non-exercising stereotype (she was considered just as attractive as the exercising and control targets). The results of this study also suggested that information provided about a woman's exercise habits can influence the ratings of her physical attractiveness, but not her personality ratings. Therefore, Martin Ginis and Leary (2006) suggested that the positive stereotype associated with being an exerciser was able to counteract any negative stereotypes associated with being overweight.

1.3.2.2.4 Target's Unhealthy Weight-Related Behaviours and Impression Formation

Research has shown that women who engage in unhealthy weight-related behaviours are perceived in a negative light when compared to women who do not engage in these behaviours. A study by Johnstone and Rickard (2006) examined whether providing information about a target's unhealthy weight-related behaviours such as excessive exercise, anorexia or bulimia, influenced the impressions formed. The results of this study demonstrated that college students viewed college women with eating and exercise-related disorders more negatively than they did controls (average student with no disorder). Targets described as being bulimic were the most negatively viewed, but anorexic targets had only minimal differences (very few significant characteristics) found between them. The targets described as excessive exercisers were perceived more positively on personality characteristics than both the bulimic and anorexic targets, but not the control target. Johnstone and Rickard (2006) suggested that excessive exercising may be a more socially acceptable form of weight control than restricting or purging. Overall, the results of this study indicated that college students negatively stereotype women with eating- and or exercise-related disorders. The results also showed that when the participant classified herself as having an eating disorder or knowing someone with an eating disorder, she tended to perceive the target with an eating disorder more favourably than the participants with no exposure to an eating disorder. These results suggest that individuals who are familiar with eating disorders tend to perceive those targets with eating disorders favourably.

1.3.2.3 Factors Related to Exercise and Impression Formation

Research has established that exercisers are perceived more positively than non-exercisers and several studies have been conducted to determine if factors such as the intensity of exercise and the type of exercise can affect impression formation (Lindwall & Martin Ginis, 2006: Martin Ginis et al., 2003; Sadalla, Linder, and Jenkins, 1988).

1.3.2.3.1 Exercise Intensity and Impression Formation

Martin Ginis and colleagues (2003) sought to determine whether the positive exerciser stereotype could extend to different intensities of exercise such as excessive exercise (high-frequency, high-intensity) or those engaging in unstructured physical activity (e.g., daily living, gardening). In this study, the typical exerciser profile was based on that used in Martin, Sinden, and colleagues (2000), where exercisers were described as going to the gym four to five times a week and participating in activities such as jogging, fitness classes and weight lifting. Active living targets (unstructured physical activity) were based on guidelines in the Canadian 'Physical Activity Guide to Healthy Active Living' (Health Canada, 1998) where the target was described as walking or riding a bike to school and taking the stairs instead of using the elevator. The excessive exerciser description was based on descriptions of excess exercise beyond recommendations for exercise needed for health benefits (e.g., exercises when injured or sick). This study concluded that individuals who are active in their daily lives (i.e., unstructured physical activity) benefit from the exerciser stereotype on both personality and physical characteristics. The excessive exercisers were found to benefit on all physical dimensions, albeit no more favourably than active living and typical exercisers,

but the same did not hold for the personality characteristics. The excessive exercisers, therefore, did not derive a greater benefit from the exerciser stereotype.

Similar results were found in a study by Lindwall and Martin Ginis (2006), that investigated the impressions formed by Swedish students of female targets. This study demonstrated that the typical exerciser and active living targets received the most favourable ratings particularly on the physical characteristics, whereas the excessive exerciser target obtained the least positive ratings. This study suggested a negative excessive exercising stereotype for a Swedish sample. This study also found that the typical exerciser target and the active living target were rated more positively overall than non-exercisers and controls on the physical characteristics, but not the personality characteristics. This contradicts to some extent prior North American literature that has shown typical exercisers and active living targets to have the more positive personality characteristics ratings. These findings may in part be due to the sample used in the study (Lindwall & Martin Ginis, 2006), which was college-aged Swedish students. Lindwall and Martin Ginis (2006) suggested that this difference could indicate that Swedish students do not ascribe the same virtues to exercise as do North American students.

1.3.2.3.2 Exercise Type and Impression Formation

Exercise type has been shown to affect impression formation. A study by Sadalla and colleagues (1988) investigated whether the type of activity engaged in (bowling, golf, tennis, skiing, or motocross racing) impacts impression formation. Results indicated that bowlers were rated less positively on all personality traits (e.g., daring) than those participating in the other activities. Findings also indicated that skiers were seen as more

attractive and that golfers and tennis players were comparable along most dimensions. It appears that individuals are perceived more positively when they are described as engaging in physical activity, regardless of type, but the impact on perception varies by activity type. Stereotypes therefore do exist based on the type of activity engaged in.

Leary (1992) suggested that one's choice of physical activity is influenced in part by self-presentational concerns. Individuals are less likely to participate in activities they associate with a negative stereotype. Males, for instance, may feel reluctant to participate in activities they consider feminine (e.g., ballet, figure skating), while females may be reluctant to participate in activities they consider masculine (e.g., football, body building). Based on this premise, a study by Drouin and colleagues (2008) found that regardless of the gender-stereotype of the chosen activity, engaging in any type of activity was found to have self-presentational benefits. A positive exerciser stereotype emerged along the physical dimensions for those participating in gender-neutral activities (e.g., running), gender-appropriate activities (e.g., female in ballet), as well as gender-opposite activities (e.g., male in ballet).

1.3.3 Special Populations, Exercise and Impression Formation

While exercisers are perceived more positively than non-exercisers, the converse holds true that those who are considered to be living an unhealthy lifestyle suffer a negative stereotype (Lindwall & Martin Ginis, 2006). An unhealthy lifestyle is typified by the consumption of unhealthy foods, physical inactivity and excessive stress. Engaging in exercise may mitigate negative perceptions that people would otherwise hold. However, the majority of studies have investigated healthy, young adult targets.

More recent research has investigated whether the exerciser stereotype also exists for other targets (e.g., older adults and those with a spinal cord injury).

1.3.3.1 Older Adults

Research has found that older adults who are described as exercisers reap similar self-presentational benefits as those of younger adult exercisers. A study by Greenlees and colleagues (2007) examined whether information about an older adult's exercise habits influenced the impressions formed of them. The impressions of three groups of participants (16-25 years old, 26-55 years old, and 56+ years old) were investigated. The results of this study concluded that exercisers received more favourable ratings on the majority of personality and physical appearance characteristics than non-exercisers and controls (for whom no exercise habits were mentioned); older adult exercisers were rated more positively on six of the 13 personality characteristics and nine out of the 10 physical characteristics. Additionally, the older participants (aged 56 and older) perceived the older adult exerciser (aged 65) more positively than the younger participants (both 16-25 year olds and 26-55 year olds). The results of this study suggested that people form more favourable impressions of older adults (aged 65 and over) who exercise when compared to older adults who do not exercise.

Faulkner and colleagues (2007) examined the impressions that young adult participants formed of older adults who were described as exercisers. This study found that older adult exercisers were rated more favourably than non-exercisers on a variety of personality and physical dimensions. The advantage of the exerciser stereotype emerged across all of the physical dimensions, as well for many important personality dimensions.

The results of this study indicated that exercise-habit information positively influences the impressions younger adults make about older adults.

1.3.3.2 Spinal Cord Injury

More recently researchers have examined whether the self-presentational benefits of exercise can be extended to other populations, such as those with a spinal cord injury. A study by Arbour and colleagues (2007) investigated the impressions formed of those with a spinal cord injury to determine if engaging in post-injury exercise was an effective strategy for managing the negative stereotype of this physical disability. As previously mentioned, research has shown that individuals with physical disabilities are often judged negatively (Arbour et al., 2007; Miller & Cordova, 2002). Arbour and colleagues (2007) determined that those with a physical disability who were described as exercisers were perceived more positively on the majority of physical and personality characteristics than non-exercisers and controls with a physical disability. Those with a spinal cord injury described as exercisers were rated more favourably on the following personality dimensions: mean-kind, few-many friends, lazy-works hard, afraid-brave, unintelligent-intelligent, sad-happy, dependent-independent, not friendly-friendly, passive-persevering, gives up easily-persistent, and helpless-self-reliant. They also received more favourable ratings on the following physical dimensions as compared to non-exercisers: sick-healthy, sexually unattractive-attractive, scrawny-muscular, unfit-fit, physically weak-physically strong, physically limited-physically liberated. Given that those with a physical disability are generally perceived more negatively (Miller & Cordova, 2002), engaging in exercise

may be an effective strategy to counteract negative stereotypes formed by those without a disability (Arbour et al., 2007).

Research investigating the impression formation benefits of exercise in other special populations is still lacking. Determining whether special populations such as cancer, AIDS, CHD or MI are perceived more positively when they are described as engaging in exercise may help promote exercise behaviours in these populations, which can play a critical role in both physiological and psychological well-being.

1.4 Limitations to Extant Literature

There are as yet no empirical studies examining the impressions formed of MI patients. Although research exists on the perception of CHD patients (Katz et al., 1987; Davison et al., 1991), these earlier studies examined only a limited number of characteristics related to impression formation. Analyzing additional characteristics may uncover other statistically significant ones that influence impression formation and also allow stereotypes of other groups to be explored. Furthermore, these studies were conducted more than twenty years ago and research today investigating the perceptions of CHD and MIs may determine whether societal perceptions have changed in the interim due to medical advances in the treatment of CHD and greater public awareness.

There also currently exists no literature examining whether the self-presentational benefits of exercise can be applied to a cardiac population as they have been to other populations, such as those with a spinal cord injury. If exercise can be shown to promote positive perceptions of individuals who have had an MI, it can be a useful strategy to reduce negative perceptions that would otherwise be held of that group.

CHAPTER TWO: RATIONALE, PURPOSE, & HYPOTHESES

2.1 Rationale

Statistics Canada (2011) reported an estimated 70,000 MI's in Canada annually and a survival rate of roughly 77%. Research has found that these survivors are at high risk of developing negative psychological outcomes, such as anxiety and/or depression (Frasure-Smith et al., 1995; Frasure-Smith et al., 1999; Schleifer & Macari-Hinson, 1989). Studies have also shown that these symptoms of anxiety and depression can increase the risk of further cardiac events (Frasure-Smith et al., 1995; Frasure Smith et al., 1999). Therefore, determining factors that contribute to the development of these symptoms can help prevent future cardiac events. One study by Stern and colleagues (1975) found that MI patients described their depressive symptoms as a result of feeling less worthwhile in others' eyes. It is possible that negative psychological outcomes following an MI may partly be the result of patients' negative feelings about how they believe they are being perceived by others (i.e., their social-image). If those with an MI are negatively stereotyped, it may pose significant social barriers and influence their psychological well-being (Leary, 1992), which in turn may play a role in post-MI depression.

There is currently no evidence to our knowledge regarding perceptions of those who have had an MI specifically. Early studies investigating perceptions of CHD patients have however concluded that individuals generally form negative perceptions of this population (Davison et al., 1991; Katz et al., 1987). As CHD is a precursor to MI, any conclusions regarding CHD patients may be applicable to MI patients. With these studies

being over two decades old, advancements in knowledge of MI, including causes and contributing factors, could lead to changes in MI perceptions (Davison et al., 1991; Katz et al., 1987). For example, it is known that the risk of MIs can be greatly reduced by engaging in a variety of behaviours such as cardiovascular exercise and eating a healthy diet (e.g., reduced fat and cholesterol intake). Knowing that an MI may be preventable by adopting healthy behaviours may lead people to believe that MI patients are partially responsible for their MI. There remains a lack of literature examining how people currently perceive MI patients and how these impressions in turn affect how MI patients feel about themselves. The current study will address this first issue.

The concern with how one is perceived can be explained by the notion of self-presentation. Self-presentation is a concept that might help in the understanding of perceptions of those who have had an MI. Self-presentation is the process by which individuals monitor and control how they are being perceived by others (Leary, 1992; Leary & Kowalski, 1990). People can attempt to control the perceptions that others form of them by engaging in a variety of self-presentational tactics. These tactics include verbal cues such as telling others about one's accomplishments and non-verbal cues such as holding open a door open for someone. Engaging in these self-presentational tactics may increase one's likelihood of being perceived more favourably. Creating these positive impressions is important because those who are perceived more positively are more likely to reap socio-cultural benefits such as romantic relationships, friendships and financial outcomes (Leary, 1995). Determining the types of impressions formed of MI patients will allow researchers to ascertain existing stereotypes, which in turn may give

individuals at risk of negative impressions the opportunity to engage in tactics that improve their social-image.

One factor associated with creating positive impressions is exercise (Arbour et al, 2007; Hodgins, 1992; Martin Ginis et al., 2003; Martin, Sinden, et al., 2000). Exercise has been shown to reduce negative stereotypes in a variety of samples such as college students, older adults and those who are overweight or have a physical disability (Arbour et al., 2007; Drouin et al., 2008; Johnstone & Rickard, 2006; Lindwall & Martin Ginis, 2006; Martin et al., 2003; Martin Ginis & Leary, 2006; Martin, Sinden, et al., 2000). Research has yet to examine whether the impression formation benefits of exercise extends to those who have had an MI. Presenting oneself as an exerciser may be an effective strategy to reduce negative stereotypes of those who have had an MI. Exercising will not only allow MI patients to reap self-presentational benefits, but it will also provide health benefits that will aid post-MI physical and mental recovery.

2.2 Purpose and Hypotheses

The primary purpose of this study was to determine whether university students perceived MI patients differently on a variety of personality and physical characteristics from those with either a different health condition (arthritis) or no health condition at all. The second purpose of this study was to examine whether MI patients described as engaging in exercise were perceived more positively than MI patients who were described as non-exercisers, or for whom no mention of exercise was made.

It was hypothesized that MI patients would be rated more negatively on physical and personality characteristics than individuals with either arthritis or no health condition. It

was predicted that negative perceptions of MI patients would emerge because of the assumption that this population engages in unhealthy behaviours, making the patients responsible for their MI. This hypothesis was also supported by prior research confirming that individuals hold negative stereotypes of CHD patients (Davison et al., 1991; Katz et al., 1987).

It was also hypothesized that MI patients described as exercisers would be perceived more positively than MI patients who are described as non-exercisers or control subjects (for whom no exercise habits are mentioned). This hypothesis was based on previous research indicating that those described as engaging in exercise are perceived more positively than those described as non-exercisers or control groups (Arbour et al., 2007; Drouin et al., 2008; Greenlees et al., 2007; Lindwall & Martin Ginis, 2006; Martin Ginis et al., 2003; Martin & Leary, 2006; Martin, Sinden, et al., 2000; Shields et al., 2007). Specifically, a study by Arbour and colleagues (2007) reported that individuals with a physical disability (spinal cord injury) described as exercisers were perceived more positively than those with a physical disability described as non-exercisers or than controls (where no exercise habits were mentioned). This study provides underlying evidence that members of special populations, such as MI patients, who are described as exercisers are more positively perceived than non-exercising or exercise-neutral members.

Additionally, although previous research has generally shown that participant and target gender do not influence the impressions formed of exercisers (Hodgins, 1992; Martin et al., 2000), a few studies investigating older adults and those with a spinal cord injury found significant interactions between gender and exercise status (Arbour et al.,

2007; Shields et al., 2007). Therefore, the participant and target gender were included in the analyses for exploratory purposes; however, no specific hypotheses were made.

2.3 Assumptions

1. All participants were familiar with heart attack and arthritis.
2. All participants were unaware of the true purpose of the study.
3. Participants answered all questionnaires accurately and honestly.
4. Randomization accounted for the variability in demographics among participants within the ten manipulation groups so that the ten groups would not significantly differ in the demographics of their assigned participants variables.

2.4 Delimitations

1. The study participants include primarily able-bodied male and female university students in the 17-28 age range.
2. The study only investigated the perceptions that were formed of individuals who have had an MI or have arthritis.
3. Exercise was the only self-presentational strategy being investigated as a means of promoting positive perceptions of MI patients.
4. The study's data was limited to ratings of targets using the selected 10 physical and 21 personality dimensions.

2.5 Definitions

Myocardial Infarction:

A myocardial infarction occurs when a blood clot occludes the flow of blood through a coronary artery and prevents oxygen from reaching the heart. A lack of oxygen to the heart can damage or destroy a part of the heart muscle. A myocardial infarction can be fatal if the heart is deprived of oxygen for a sufficiently long period of time.

Self-Presentation:

Self-presentation is the process by which people attempt to monitor and control the images that others form of them.

Impression Formation:

Impression formation is the process by which people form their impressions of other individuals.

CHAPTER 3: METHODOLOGY

3.1 Participants

Four hundred and ninety six undergraduate and graduate participants were recruited for this study. Three cases were deleted for untrustworthy answers (e.g., making graphic designs or comments on questionnaire package), eleven were deleted due to missing values, and nine were deleted as outliers. A detailed description of the cases that were deleted will be provided in Chapter 4. As a result, the final sample consisted of four hundred and seventy three individuals. Previous literature (Arbour et al., 2007; Martin et al., 2003; Martin Ginis & Leary, 2006; Martin, Sinden, et al, 2000) using a research design similar to that used in this study reported moderate-to-large effect sizes for the target's exercise status ($ES = 0.80$). Sample size calculations, with power = 0.80 and $\alpha = 0.05$, indicated a recommended sample size of approximately 320 participants total (32 per group; Cohen, 1992). Therefore the current sample size satisfies our minimum requirement, with approximately 45 participants per group

Participants were recruited by means of verbally scripted announcements made in undergraduate classes (Appendix A) and through posters placed around the Brock University campus (Appendix B). There were no specific inclusion criteria other than being a university student. Participants consisted of university males ($n = 155$) and females ($n = 318$) between the ages of 17 and 28 years old. Descriptive statistics (mean and standard deviations [SD]) are provided in Table 1 by gender.

Table 1

Demographics and Physical Activity Variables by Group

	Male (n = 155)		Female (n = 318)	
Variable	Mean	SD	Mean	SD
Age	20.54	2.42	19.46	1.86
Academic Year	2.57	1.54	2.02	1.36
Height (cm)	179.14	9.66	166.08	6.86
Weight (kg)	79.32	12.62	61.21	10.35
BMI	24.82	4.56	22.17	3.55
Exercise per week	4.00	2.35	2.95	1.84
Minutes per exercise session	69.27	35.58	60.74	27.46

Note. Exercise per week = the number of times the participant exercised a week; Minutes per exercise session = the average duration of exercise sessions; BMI = body mass index, calculated as weight (kg)/ (height (m))^2.

3.2 Measures

Participants completed a questionnaire package that included a demographic questionnaire (Appendix C), one target description (Appendix D), target ratings questionnaire (Appendix E), and a myocardial infarction familiarity questionnaire (MIF) (Appendix F).

3.2.1 Demographics

The demographic self-report questionnaire captured the participant's age, gender, academic major, academic year, height, and weight. Participants were also queried about their weekly average exercise frequency, the average exercise duration, and the type of exercise typically engaged in.

3.2.2 Target Descriptions

The target descriptions used in this study were modeled on those used by Martin, Sinden, and colleagues (2000), with modifications to the target's gender (female/male), health status (MI patient/arthritis patient/no health condition) and exercise status (exerciser/non-exerciser/control) to create 10 different target descriptions. The target descriptions in this study described an individual with specific characteristics in a short paragraph. The paragraphs for all 10 descriptions were identical except for the portions describing the target's gender, health status and exercise status. The portions that described the target's health status and exercise status were used to create five distinct descriptions. Adding the target's gender status then doubled the number of target descriptions to 10. The following is the healthy control description, with no mention of either health status or exercise status.

> (Mary/John) has brown eyes and short brown hair. (She/He) is a former high school history teacher and is currently going through a career change. (She/he) has lived in (her/his) home for five years now with (her/his) spouse but their three grown-up children have all moved out. Two of (her/his) daughters moved out of the country for work, while the youngest son stayed in the area to be near his family. In (Mary/John)'s spare time (she/he) likes to read the newspaper, play the

> guitar, and spend time with (her/his) family and friends. (Mary/John) also likes to travel.

For the first purpose of this study, examining whether MI patients were perceived more negatively than healthy individuals (control) or individuals with another health condition (arthritis targets), sentences modifying the target's health status were added at the end of the healthy control description to create two additional target descriptions. Targets described as having had an MI had the following sentences added:

> Mid-summer (Mary/John) had a heart attack and was brought to the hospital for cardiac treatment. After undergoing treatment, (she/he) returned home for recovery.

Targets described as having arthritis had the following sentences added:

> Mid-summer (Mary/John) was diagnosed with rheumatoid arthritis and received treatment to reduce pain and joint inflammation. (He/She) is now continuing treatment at home.

The arthritis target description was used to verify that any difference in the ratings between the MI and healthy control targets were attributable to MI specifically and not to health conditions in general. Should the perception of MI and arthritic targets be similar in terms of the physical and personality characteristics, it may be evidence of the existence of a general health condition stereotype rather than a specific MI stereotype. Rheumatoid arthritis was selected as the other health condition in this study for two reasons. Firstly, arthritis is a condition that individuals are generally familiar with, as it is

a common health condition amongst Canadians. Statistics Canada showed that approximately four and a half million Canadians are afflicted with arthritis (Statistics Canada, 2013). Compared to other health conditions, such as multiple sclerosis, thyroid disease or fibromyalgia, the use of an arthritic target description allowed the majority of the participants to understand what they were reading. Rheumatoid arthritis is an autoimmune disorder that occurs when the synovial membrane releases a natural enzyme that breaks down connective tissue in the body (Firestein, 2003).

Second, the arthritis target description was selected because the cause of this health condition is generally unknown (American College of Rheumatology, 2002). Rheumatoid arthritis is typically a condition that is not thought to be inflicted on oneself, but is an autoimmune disorder caused by unknown etiology that afflicts individuals at random (American College of Rheumatology, 2002). Although MI's can also affect individuals at random, they can also be caused by individuals choosing to engage in unhealthy behaviours (e.g., smoking, inactivity, poor diet; Wulsin, 2012).

For the second purpose of the study, examining whether MI patients who exercise are perceived more positively than MI patients who do not exercise, two additional target descriptions were created by adding a sentence describing exercise status (exerciser/non-exerciser/control) to the description of the MI target. The following sentence was added to the MI paragraph for the exerciser:

> <u>(She/he) now works out at the gym about 3-4 times a week, and these exercises generally consist of walking, stretching, and some weight training.</u>

The following sentence was added to the MI paragraph for the non-exerciser:

(Mary/John) does not currently participate in any physical activities such as walking, stretching, or weight training.

In summary, the study employed five different target descriptions, each with a version for a male and female target: (1) the healthy control target (no health condition and no exercise habits mentioned), (2) the arthritis target (no exercise habits mentioned) (3) the MI target (no exercise habits mentioned), (4) the MI/exerciser target, and (5) the MI/non-exerciser target. A statistical comparison of the ratings for targets 1, 2 and 3 was conducted to reveal whether MI patients were perceived more negatively than those who have not suffered an MI. A statistical comparison of the ratings for targets 1, 4 and 5 was also conducted to reveal whether exercising MI patients were perceived more positively than non-exercising ones.

3.2.3 Target Ratings

Two categories of target ratings were completed.

3.2.3.1 Personality Ratings

Using a 21-item personality dimension scale, participants were asked to rate targets on the following personality characteristics: mean/kind, few friends/many friends, lazy/works hard, afraid/brave, unintelligent/intelligent, sloppy/neat, sad/happy, lacks self-confidence/has self-confidence, lacks self control/has self control, unsociable/sociable, dependent/independent, not friendly/friendly, passive/persevering, incompetent/competent, self-pitying/not self-pitying, gives up easily/persistent, helpless/self-reliant, calm/angry, optimistic/pessimistic, health conscious/not health conscious, and stress/not stressed. These characteristics were based on studies using a

similar design that investigated healthy college-aged participants' perceptions of targets that exercise (Martin, Sinden, et al., 2000) and targets with a spinal cord injury that exercise (Arbour et al., 2007). These characteristics were also based on a study by Davison and colleagues (1991) that identified lay perceptions of individuals with CHD. Each item was rated using a 9-point semantic differential rating scale where opposing word pairs were anchored at either end of the scale (e.g. 1 = not friendly, 9 = friendly).

3.2.3.2 Physical Ratings

Using a 10-item physical dimension scale, participants were asked to rate the target on the following physical characteristics: ugly/good-looking, sexually unattractive/sexually attractive, underweight/overweight, scrawny/muscular, physically sickly/physically healthy, has an attractive figure/has an unattractive figure, unfit/fit, physically weak/physically strong, physically limited/physically liberated, and frail/sturdy. As with the personality characteristics, the physical characteristics were also selected based on previous studies using a similar design (Arbour et al., 2007; Davison et al., 1991; Martin, Sinden, et al., 2000). Each item on this scale was rated using a 9-point semantic differential rating scale where opposing word pairs were anchored at either end of the scale (e.g. 1 = physically weak, 9 = physically strong).

3.2.4 Myocardial Infarction Familiarity Questionnaire

This self-report questionnaire was completed last and asked the participant whether he/she has had a cardiac condition and whether the participant has personally known someone who has had a heart condition. The responses were provided by marking either the 'yes' or 'no' check boxes. If the participant indicated knowing someone who had

a heart condition, the questionnaire asked for a description of the relationship to this individual and the type of heart condition, if known. This questionnaire was included to determine whether individuals more familiar with MI through personal experience form less negative perceptions than those with no exposure.

3.3 Procedures

Ethics clearance was obtained from the Research Ethics Board at Brock University (Appendix G). Study participants were recruited to participate in a study examining university students' beliefs of others in order to obfuscate the real purpose of the study. If participants were aware that the study's real objective was to investigate their perceptions of MI patients, their input could be influenced by what they feel would be a socially appropriate response. The true purpose of the study was concealed in order to obtain participants' true and honest beliefs. Posters placed around the university campus and announcements made in academic classes were used to recruit participants. Those interested in participating in this study were asked to contact the researcher via email. If participants showed interest in the study, a testing session was scheduled at their convenience. The testing sessions were conducted in either an individual or group setting.

At the start of the testing session the researcher provided the participant with a consent form (Appendix H) and verbally informed him/her that handing in the questionnaire package would imply consent for the study. The researcher then distributed a randomly selected questionnaire package. Completing the questionnaire package started with filling out the demographic questionnaire and the reading of a target description (each questionnaire contains one of the 10 target descriptions used in the study). After reading the target description, the participant was asked to conjure up a vivid picture of

the target and to then rate the target on the physical and personality rating questionnaire. The participant then answered the short myocardial infarction familiarity questionnaire and was verbally debriefed (Appendix I) as to the true purpose of the study. At the conclusion of the testing session the participant was provided with a "Summary of Results Request Form" if desired (see Appendix J).

3.4 Hypothesis Testing

The MIF questionnaire was analyzed using a point-biserial correlation to determine if the number of people who knew someone that has had a cardiac condition was correlated with the personality or physical ratings. If the MIF responses were found to be significantly correlated with the ratings, it was used as potential covariate in the main MANOVA analyses. Similarly, correlations were conducted between the participants' exercise status and the physical and personality ratings of both the exercising and non-exercising MI targets. If the participants' exercise status was found to be significantly correlated with the ratings, it was also used as a covariate in the main MANOVA analyses for the second research question.

Although preliminary research has generally found that the participants' gender does not influence the perceptions formed of older adults or of exercisers vs. non-exercisers (Kite et al., 2005; Martin Ginis et al., 2003), it was examined in the main analyses of this study. To date, research has only investigated the influence of participants' gender in healthy-exercising populations, and has yet to be examined in other populations (e.g., physical disability). Given that the current study examined perceptions of individuals who have had an MI, the participant's gender was explored in both analyses (health status analysis and exercise status analysis)

3.4.1 Research Question One

In order to determine whether participants perceived targets who had suffered an MI differently from healthy targets or those with arthritis, two separate 2 (participant gender: male vs. female) x 2 (target gender: male vs. females) x 3 (health status: MI target vs. arthritis target vs. healthy control target) MANOVAs were conducted, one for personality and one for physical characteristics. First, interaction effects were examined for significance. Significant interactions were examined by exploring simple effects. Simple effects explore the nature of the interaction by examining the difference between groups within one level of one of the independent variables. Significant simple effects were followed-up with Tukey post hoc analyses. Alternatively, if no significant interactions were found, main effects were then examined for significance. If significant main effects were apparent, follow-up univariate ANOVAs were conducted. If significant univariate ANOVAs emerged, Tukey post hoc analyses were conducted. Next, Partial eta squared effect sizes were also computed.

3.4.2 Research Question Two

In order to determine whether MI targets described as exercisers are perceived more positively than non-exercising targets or control targets, two separate 2 (participant gender: male vs. female) x 2 (target gender: male vs. female) x 3 (exercise status: exerciser vs. non-exerciser vs. exercise control targets) MANOVAs were conducted, one for personality and one for physical characteristics. As for research question one, significant main effects and interaction effects were followed up with the same data analysis.

CHAPTER 4: RESULTS

4.1 Data Analysis

All data was analyzed using SPSS 20.0. Data was first screened for missing data and statistical assumptions were then checked by running the appropriate statistical tests for a MANOVA. Finally, hypothesis testing was conducted.

4.2 Item Recoding

Once the final sample size was determined (n = 473), three items in the target rating scales were reverse coded (Calm vs. angry, optimistic vs. pessimistic, health-conscious vs. not health-conscious. Thus, for all items, higher scores represented more positive characteristics.

4.3 Data Cleaning

Prior to analyzing the data, it was screened for missing and inaccurate values/data entry errors. Frequencies were first run on all variables to identify any incorrect values. Incorrect values were identified as values outside the reasonable limits of the variable. Seven inaccurate values were identified, and the original response was revisited to attain the correct value. The original values were then used to replace the inaccurate values.

In order to identify missing data, the dataset was first visually screened for missing variables. Thirty-one participants were identified as having missing data. Eleven participants were identified as having two or more variables missing and were deleted as a result of the fact that they were missing scores on two or more dependent variables. These participants were randomly distributed among the groups. The remaining twenty participants were only missing a single value and were retained.

Following visual screening, a Missing Value Analysis was run. If less than five percent of data was missing and it was dispersed among the data set it was considered random. The Missing Value Analysis determined that the variable weight had more than five percent missing data. Visual inspection showed that the missing values were dispersed among the group. Since research has shown that it is not uncommon for participants to be uncomfortable revealing their weight (Kuczmarski, Kuczmarski, & Najjar, 2001), the weight variable was not removed.

4.3.1 Univariate and Multivariate Outliers

Univariate outliers are cases that have data values that are very different from the data values for the majority of cases in the data set. Outliers are important because they can disproportionally influence the data analysis. Whether we include or exclude outliers from a data analysis depends on the reason why the case is an outlier and the purpose of the analysis. Univariate outliers were identified by checking for extreme values in the distribution that affect the normality of the distribution - values with very large z-scores (Tabachnik & Fidell, 2007) over +3.29 ($p < .001$). A total of 51 possible univariate outliers (28 participants total, with some having potential outliers on more than one variable) were identified. Five cases were identified for the age variable. These participants were all over 30 years of age and were removed from the data set, as they fell outside the young adult range. The remaining potential outliers were all on the target rating scale items (the dependent variables). After visually screening the univariate outliers in the target rating scale, all values had meaningful values that were connected to the other scores. Thus, they were determined not to be true outliers.

Multivariate outliers are cases with extreme or unusual combinations of variables. Mahalanobis' distance was used to identify potential multivariate outliers. This test identifies multivariate outliers that affect normality. Mahalanobis' distance values were compared to the critical values of the chi-square distribution table, with the degrees of freedom equal to the number of dependent variables (n = 31) at $p < .001$ (Tabachnick & Fidell, 2007). Any cases with a Mahalanobis' distance greater than or less than 59.70 were further examined as potential multivariate outliers. As a result, 30 cases were found to have a Mahalanobis' distance greater than or less than 59.70. These 30 cases were visually inspected and four cases were consequently deleted from the dataset. These four cases were deleted for suspicious, untrustworthy responses. As previously mentioned, three dependent variables were reverse coded in the target rating scale. These four cases had inconsistent values between their reverse coded variables and regularly coded variables in the target ratings scales, suggesting untrustworthy responses.

4.4 Assumptions of Data Analyses

All data was initially screened to ensure that the assumptions of the main analysis were met. These assumptions included normality, homogeneity of variance and covariance, and multicollinearity.

4.4.1 Normality

Univariate normality implies that the distributions of all the means of the dependent variables were normal in the dataset. The distribution of each dependent variable was checked by calculating means and standard deviations, values of kurtosis and skewness, and observation of frequency histograms (see Table 2 for means and standard deviations). A measure of kurtosis indicates the peakedness of the distribution,

whereas skewness indicates the symmetry of a distribution (Tabachnik & Fidell, 2007). According to Kim (2013), when dealing with large sample sizes, skewness values greater than ± 2 and kurtosis values greater than ± 7 are of concern. The further away the value is from zero, the further the distribution is from being normal.

Observation of the descriptive statistics and histograms indicated that the measures of central tendency, skewness and kurtosis for all of the dependent variables were normal. This was not unexpected considering that large sample sizes tend to be robust to normality.

Statistical significance testing (Tabachnick & Fidell, 2007) was not conducted because they have been reported to be unsuitable for large sample sizes (Kim, 2013). This is because the significance test may become so powerful that it detects departures from normality that are statistically significant, but not of importance. Therefore, the assumption of normality was met for this dataset.

Table 2

Descriptives for Target Ratings

Variable	*Mean*	*Median*	*Mode*	*SD*	*Sk*	SE_{Sk}	*K*	SE_K
Mean vs. Kind	7.28	7.00	7.00	1.29	-0.69	0.11	0.61	0.22
Few friends vs. many friends	6.15	6.00	7.00	1.67	-0.41	0.11	-0.28	0.22
Lazy vs. works hard	6.21	7.00	7.00	1.87	-0.58	0.11	-0.33	0.22
Afraid vs. brave	5.97	6.00	5.00	1.63	-0.25	0.11	-0.33	0.22
Unintelligent vs. intelligent	7.28	8.00	8.00	1.47	-1.59	0.11	3.66	0.22
Sloppy vs. neat	6.38	7.00	7.00	1.68	-0.68	0.11	0.40	0.23
Sad vs. happy	6.27	7.00	7.00	1.71	-0.54	0.11	-0.21	0.22
Lacks self-confidence vs. has self-confidence	6.22	7.00	7.00	1.62	-0.63	0.11	0.22	0.22
Lacks self-control vs. has self-control	6.49	7.00	7.00	1.60	-0.62	0.11	0.27	0.22
Unsociable vs. sociable	6.83	7.00	7.00	1.76	-0.86	0.11	0.44	0.22
Dependent vs. independent	6.81	7.00	8.00	1.57	-0.85	0.11	0.92	0.22
Not friendly vs. friendly	7.33	8.00	8.00	1.45	-1.38	0.11	2.79	0.22
Passive vs. persevering	6.25	6.00	7.00	1.65	-0.37	0.11	-0.52	0.23
Incompetent vs. competent	6.95	7.00	8.00	1.47	-1.13	0.11	1.81	0.22
Self-pitying vs. no self-pitying	6.56	7.00	7.00	1.70	-0.72	0.11	0.41	0.22
Gives up easily vs. persistent	6.53	7.00	7.00	1.78	-0.70	0.11	0.29	0.22
Helpless vs. self-reliant	6.66	7.00	7.00	1.57	-0.77	0.11	0.75	0.22
Calm vs. angry	6.12	6.00	7.00	1.87	-0.34	0.11	-0.51	0.22
Optimistic vs. Pessimistic	5.87	6.00	5.00	1.90	-0.23	0.11	-0.49	0.23
Health conscious vs. not health conscious	5.13	5.00	5.00	2.09	0.02	0.11	-0.79	0.22
Stressed vs. not stressed	5.17	5.00	5.00	1.78	-0.02	0.11	-0.37	0.22
Ugly vs. good looking	5.61	5.00	5.00	1.38	-0.10	0.11	1.19	0.22
Sexually unattractive vs. sexually attractive	5.21	5.00	5.00	1.53	-0.23	0.11	1.20	0.23
Overweight vs. underweight	4.83	5.00	5.00	1.35	-0.23	0.11	1.20	0.23
Scrawny vs. muscular	4.88	5.00	5.00	1.15	-0.57	0.11	2.20	0.22
Physically sickly vs. physically healthy	5.21	5.00	5.00	1.65	-0.34	0.11	-0.00	0.22
Unattractive figure vs. attractive figure	5.11	5.00	5.00	1.28	-0.25	0.11	1.65	0.22
Unfit vs. fit	4.82	5.00	5.00	1.63	-0.05	0.11	-0.30	0.22
Physically weak vs. physically strong	4.88	5.00	5.00	1.51	-0.00	0.11	-0.11	0.22
Physically limited vs. physically liberated	5.13	5.00	5.00	1.71	0.07	0.11	-0.27	0.22
Frail vs. sturdy	5.37	5.00	5.00	1.56	-0.02	0.11	-0.09	0.22

Note. All variables are rated on a 9-point semantic differential rating scale where opposing word pairs are anchored at either end of the scale (e.g. 1 = Frail, 9 = Sturdy).

4.4.2 Homogeneity of Variance-Covariance Matrices

The assumption of homogeneity of variance and covariance is that the variance and covariance within each of the groups is approximately equal for each variable (Field, 2013). Homogeneity of the variance-covariance matrices was tested using Box's M test, which tests the statistical hypothesis that the variance-covariance matrices are equal. A non-significant value indicates that the variability in scores for one continuous variable is roughly the same at all values of another continuous variable.

Sample sizes were relatively equal for all groups (MI Condition, n = 93; Arthritis Condition, n = 96; health control condition, n = 95; MI exercise condition, n = 92; MI non-exercise condition, n = 97; MI exercise control condition, n = 93) and should therefore be robust to Box's M. This is because a violation of this assumption has minimal impact if the groups are of approximately equal sizes (IBM, 2012). Although group sizes were relatively equal, Box's M was conducted among all groups for each variable and was found to be significant for all variables across groups. According to Field (2013), Box's M is sensitive to large sample sizes, and a Levene's test may be more suitable. When conducting a Levene's test, a non-significant value indicates homogeneity of variance and covariance, similar to the Box's M test. As a result, Levene's test was conducted and also revealed significant differences among many variables. However, Levene's test can also be too sensitive for large data files (IBM, 2012). IBM suggests that large sample sizes require the graphical examination of scatterplots among all dependent variables that depict the spread (standard deviation) versus the level plot for every variable. This provides a visual test of the equal variances assumption, with the added benefit of helping to assess whether violations of the assumption are due to a relationship

between the cell means and standard deviations. Visual confirmation concluded that all of the dependent variables had no apparent relationships, and therefore the assumption of homogeneity of variance-covariance was met.

4.4.3 Multicollinearity

All dependent variables were tested for any highly correlated relationships that indicate the use of redundant variables. Pearson's bivariate correlations were run on all dependent variables within each group (i.e., physical and personality ratings) and values exceeding 0.90 were flagged to investigate variables for redundancy. No evidence of multicollinearity emerged (see Table 3, 4 and 5 for all correlations by group) and therefore no variables were removed.

Table 3

Pearson Bivariate Correlations between Variables for Physical Ratings

Variable	1	2	3	4	5	6	7	8	9	10
1. Ugly vs. good looking	1	-	-	-	-	-	-	-	-	-
2. Sexually vs. unattractive	0.64**	1	-	-	-	-	-	-	-	-
3. Frail vs. sturdy	0.29**	0.29**	1	-	-	-	-	-	-	-
4. Overweight vs. underweight	0.25**	0.22**	0.10*	1	-	-	-	-	-	-
5. Scrawny vs. muscular	0.29**	0.29**	0.40**	0.15**	1	-	-	-	-	-
6. Physically sickly vs. physically healthy	0.30**	0.29**	0.48**	0.32**	0.31**	1	-	-	-	-
7. Unattractive figure vs. attractive figure	0.48**	0.52**	0.35**	0.36**	0.40**	0.53**	1	-	-	-
8. Unfit vs. fit	0.37**	0.33**	0.50**	0.40**	0.38**	0.61**	0.60**	1	-	-
9. Physically weak vs. physically strong	0.34**	0.35**	0.61**	0.23**	0.49**	0.58**	0.51**	0.76**	1	-
10. Physically liberated vs. physically limited	0.27**	0.25**	0.61**	0.27**	0.34**	0.57**	0.46**	0.66**	0.71**	1

Note. *p<0.05; **p<0.01

Table 4

Pearson Bivariate Correlations between Variables for Personality Ratings (first half)

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Mean vs. Kind	1	-	-	-	-	-	-	-	-	-	
2. Few friends vs. many friends	0.26**	1	-	-	-	-	-	-	-	-	
3. Lazy vs. works hard	0.32**	0.20**	1	-	-	-	-	-	-	-	
4. Afraid vs. brave	0.22**	0.22**	0.53*	1	-	-	-	-	-	-	-
5. Unintelligent vs. intelligent	0.32**	0.17**	0.35**	0.43**	1	-	-	-	-	-	
6. Sloppy vs. Neat	0.29**	0.13**	0.40**	0.36**	0.52**	1	-	-	-	-	
7. Sad vs. Happy	0.39**	0.37**	0.34**	0.32**	0.40**	0.40**	1	-	-	-	
8. Lacks self-confidence vs.	0.30**	0.34**	0.45**	0.47**	0.44**	0.41**	0.54**	1	-	-	
9. Lacks self-control vs. self-control	0.39**	0.20**	0.42**	0.40**	0.45**	0.45**	0.47**	0.61**	1	-	
10. Unsociable vs. sociable	0.25**	0.58**	0.34**	0.33**	0.32**	0.27**	0.49**	0.46**	0.40**	1	
11. Dependent vs. independent	0.19**	0.19**	0.31**	0.33**	0.38**	0.36**	0.27**	0.31**	0.37**	0.36**	1

Note. *p<0.05; **p<0.01

Table 5

Pearson Bivariate Correlations between Variables for Personality Ratings (second half)

Variable	12	13	14	15	16	17	18	19	20	21
12. Not friendly vs. friendly	1	-	-	-	-	-	-	-	-	-
13. Passive vs. persevering	0.39**	1	-	-	-	-	-	-	-	-
14. Incompetent vs. competent	0.48**	0.50**	1	-	-	-	-	-	-	-
15. Self-pitying vs. not self-pitying	0.46**	0.44**	0.52**	1	-	-	-	-	-	-
16. Gives up easily vs. persistent	0.36**	0.50**	0.46**	0.67**	1	-	-	-	-	-
17. Helpless vs. self-reliant	0.46**	0.44**	0.48**	0.60**	0.69**	1	-	-	-	-
18. Angry vs. calm	0.31**	0.13**	0.23**	0.22**	0.19**	0.21**	1	-	-	-
19. Pessimistic vs. optimistic	0.26**	0.24**	0.27**	0.26**	0.27**	0.28**	0.51**	1	-	-
20. Not health conscious vs. health conscious	0.08**	0.25**	0.10*	0.21**	0.30**	0.21**	0.26**	0.31**	1	-
21. Stressed vs. not stressed	0.15**	0.13**	0.15**	0.22**	0.17**	0.21**	0.10*	0.03	0.04	1

Note. *p<0.05; **p<0.01.

4.5 Randomization Check

To check that randomization was effective, between-group comparisons of participant's demographic characteristics were analyzed. A series of 2 (participant gender) x 2 (target gender) x 3 (health status: MI target vs. arthritis target vs. healthy control target) ANOVAs and 2 (participant gender) x 2 (target gender) x 3 (exercise status: exerciser vs. non-exerciser vs. exercise control target) ANOVAs were conducted to check for differences among each of the continuous demographic variables (e.g., height, weight, BMI, age, and academic year,). No significant differences were found between any groups (in both analyses) for all continuous demographic variables (all *p*s > 0.05), except for the participant's gender. The participant's gender revealed significant differences among all demographic variables (all *p*s < 0.01). As expected, male participants were taller (*M* = 1.80m, *SD* = 0.10) than female participants (*M* = 1.66m, *SD* = 0.07), heavier (*M* = 79.08kg, *SD* = 12.22) than females (*M* = 60.93kg, *SD* = 10.83), and had a higher BMI (*M* = 24.52, *SD* = 3.42) than females (*M* = 22.09, *SD* = 3.42). It was also found that the male participants were slightly older (*M* = 20.60 years *SD* = 2.51) compared to females (*M* = 19.42 years, *SD* = 1.81), and in a higher academic year (*M* = 2.55, *SD* = 1.56) compared to females (*M* = 2.05, *SD* = 1.36). Given that the age difference was only about one year and the physical characteristic differences were expected, participant gender was retained as an independent variable for subsequent analyses.

Additionally, categorical data (e.g., target's major) was analyzed using a chi-square analyses. Results indicated no significant differences for the participant's academic major between all 10 groups (*p*s < 0.05).

4.6 Data Analysis

Prior to running the main analyses, potential covariates were examined. The MIF questionnaire was analyzed using a point-biserial correlation to determine if the number of participants who knew someone who had previously had an MI correlated with the personality or physical ratings. The correlations revealed that participants who knew someone who had an MI significantly correlated with one personality variable, unintelligent vs. intelligent (r = -0.10, $p < 0.05$). It was decided not to use the MIF as a covariate for the main analysis, as it only correlated with one of the 31 ratings, and the magnitude of that correlation was small. The MIF was also used to determine whether the number of participants who have had an MI correlated with the personality and physical ratings. Only 31 of the 473 participants reported having a heart condition, which were either not further elaborated on or were described as heart arrhythmias. Given that none reported having had an MI, a correlation was unable to be conducted.

Additionally, a Pearson's bivariate correlation was conducted to determine whether the participants' exercise status correlated with either the physical or personality ratings. This was only determined for the 2 (participant gender: male vs. female) x 2 (target gender: male vs. female) x 3 (exercise status: exerciser, non-exerciser, vs. exercise control) MANOVA analysis. This was conducted because previous research has shown that participants who classified themselves as exercisers perceived other exercisers favourably (Faulkner et al., 2007; Martin Ginis et al., 2003; Taijfel & Turner, 1979). Bivariate correlations revealed that there were only two significant correlations, one within the personality characteristics (Lacks self-control vs. has self control, r = -0.12 $p <$ 0.05) and one within the physical characteristics (Scrawny vs. muscular, r = -0.14 $p <$

0.05). As a result, this variable was not used as a covariate for the main analysis, as it only significantly correlated with two of the 31 ratings and the magnitude of the correlations were small.

4.6.1 Data Analysis for Research Question One

In order to examine Research Question One, two separate 2 (participant gender: male vs. female) x 2 (target gender: male vs. female) x 3 (health condition status: MI target vs. arthritis target vs. healthy control target) MANOVAs were conducted to examine whether participants perceived targets who have suffered an MI differently from healthy targets or those with arthritis, one for personality characteristics and one for physical characteristics. The first MANOVA was analyzed using the personality characteristics as the dependent variables. The results revealed a significant main effect for the target's health status, $F(42, 490) = 1.57$, $p < 0.05$, $\eta_p^2 = 0.20$, but no main effect for the target's gender, $F(21, 244) = 1.50$, $p = 0.08$, $\eta_p^2 = 0.11$ or the participants' gender, $F(21, 244) = 1.13$, $p = 0.32$, $\eta_p^2 = 0.09$. The interaction between target gender and participant gender was found to be significant, $F(21, 244) = 1.83$, $p < 0.05$, $\eta_p^2 = 0.14$, but the interactions between target gender and health status, $F(42, 490) = 1.06$, $p = 0.37$, $\eta_p^2 = 0.08$, participant gender and health status, $F(42, 490) = 1.12$, $p = 0.30$, $\eta_p^2 = 0.09$, and the 3-way interaction between target gender, participant gender and health status were not significant, $F(42, 490) = 0.95$, $p = 0.57$, $\eta_p^2 = 0.08$.

To examine the significant main effect for health status, follow up univariate ANOVAs were conducted for the target's health status among all of the personality characteristics. Results showed that differences were found on five of the 21 personality characteristics: lacks self-confidence/has self-confidence, $F(2,264) = 8.22$, $p = 0.05$, η_p^2

= 0.02, gives up easily/persistent, $F(2, 264) = 13.37$, $p < 0.01$, $\eta_p^2 = 0.04$; helpless/self-reliant, $F(2, 264) = 7.62$, $p < 0.05$, $\eta_p^2 = 0.03$; health conscious/not health conscious, $F(2, 264) = 16.23$, $p < 0.01$, $\eta_p^2 = 0.04$; and stressed/not stressed, $F(2, 264) = 16.34$, $p < 0.01$, $\eta_p^2 = 0.04$). To examine the specific differences on these personality ratings by health status (MI vs. arthritis vs. healthy control), Tukey post-hoc follow-up tests were conducted. Post-hoc tests revealed that university students perceived individuals who were described as having an MI to give up more easily and be less health conscious when compared to individuals with arthritis (all *p*s < 0.05). Individuals who were described as having an MI were perceived as being more stressed ($p < 0.05$) when compared to healthy controls, and individuals with arthritis were perceived as being more health conscious than healthy controls ($p < 0.05$, see Table 6 for means and standard deviations).

Second, follow-up simple effects were conducted for the interaction between the target's gender and the participant's gender among the personality characteristics. A simple effect was first run to examine the differences between target gender (male and female) within male participants. One-way ANOVAs revealed significant differences among the ratings of unintelligent/intelligent, $F(1, 153) = 9.76$, $p < 0.01$; dependent/independent, $F(1,153) = 10.17$, $p < 0.01$; gives up easily/persistent, $F(1,153) = 4.91$, $p < 0.05$; and helpless/self-reliant, $F(1,153) = 6.01$, $p < 0.05$. Results showed that the male participants rated the male target ($M = 6.67$, $SD = 1.75$) less intelligent than the female target ($M = 7.43$, $SD = 1.09$), more dependent ($M = 6.29$, $SD = 1.58$) than the female target ($M = 7.03$, $SD = 1.28$), and more helpless ($M = 6.35$, $SD = 1.35$) than the female target ($M = 6.87$, $SD = 1.27$). A simple effect was then conducted to examine the

differences between target gender (male and female) within female participants. One-way ANOVAs revealed significant differences among the rating for sloppy/neat, $F(1,315) = 12.34$, $p < 0.01$. Results found that female participants rated the male target as being more sloppy ($M = 6.11$, $SD = 1.70$) when compared to female target ($M = 6.76$, $SD = 1.58$).

Table 6

Means and standard deviations for the personality characteristics by health status

	MI		Arthritis		Healthy Control	
Variable	Mean	SD	Mean	SD	Mean	SD
Mean/Kind	7.21_{a}	1.24	7.25_{a}	1.47	7.37_{a}	1.14
Few friends/many friends	5.93_{a}	1.75	6.08_{a}	1.79	6.30_{a}	1.75
Lazy/works hard	6.23_{a}	1.79	6.60_{a}	1.81	6.40_{a}	1.79
Afraid/brave	5.89_{a}	1.50	6.24_{a}	1.74	6.05_{a}	1.64
Unintelligent/intelligent	7.32_{a}	1.40	7.64_{a}	1.33	7.53_{a}	1.38
Sloppy/neat	6.28_{a}	1.70	6.68_{a}	1.57	6.47_{a}	1.71
Sad/happy	6.37_{a}	1.55	6.17_{a}	1.79	6.58_{a}	1.67
Lacks self-confidence/has self-confidence	6.07_{a}	1.56	6.35_{a}	1.69	6.54_{a}	1.52
Lacks self-control/has self-control	6.50_{a}	1.47	6.87_{a}	1.55	6.81_{a}	1.38
Unsociable/sociable	6.96_{a}	1.57	6.76_{a}	1.71	6.77_{a}	2.02
Dependent/independent	6.81_{a}	1.39	6.86_{a}	1.65	7.00_{a}	1.67
Not friendly/friendly	7.39_{a}	1.41	7.24_{a}	1.51	7.27_{a}	1.71
Passive/persevering	6.20_{a}	1.55	6.24_{a}	1.75	6.36_{a}	1.54
Incompetent/competent	6.99_{a}	1.37	7.08_{a}	1.51	7.10_{a}	1.35
Self-pitying/no self-pitying	6.50_{a}	1.64	6.92_{a}	1.54	6.71_{a}	1.66
Gives up easily/persistent	6.34_{a}	1.67	7.09_{b}	1.43	6.58_{ab}	1.73
Helpless/self-reliant	6.38_{a}	1.53	6.65_{a}	1.55	7.09_{a}	1.36
Angry/calm	6.00_{a}	1.88	6.33_{a}	1.92	6.36_{a}	1.99
Pessimistic/optimistic	5.98_{a}	1.88	6.00_{a}	1.80	5.68_{a}	2.02
Not health conscious/health conscious	4.80_{a}	1.73	5.65_{b}	1.86	4.88_{a}	1.87
Stressed/not stressed	4.91_{a}	1.71	5.34_{ab}	1.56	5.78_{b}	1.94

*Note***.** Values in the same row that do not share a common subscript letter are significantly different. Higher mean scores correspond to more positive ratings of the personality characteristic pairs. All ratings are on a 9-point semantic differential scale.

The second MANOVA was analyzed using the physical characteristics as the dependent variables. The results revealed a significant main effect for the target's gender, $F(10, 258) = 2.72$, $p < 0.01$, $\eta_p^2 = 0.10$, for the target's health status, $F(20, 518) = 3.09$, $p < 0.001$, $\eta_p^2 = 0.11$, and for the participant's gender, $F(10, 258) = 1.20$, $p < 0.05$, $\eta_p^2 = 0.07$. All interactions yielded non-significant findings. Follow-up ANOVAs were conducted separately for the target's gender, the target's health status and the participant's gender among all of the physical characteristics.

Follow-up univariate ANOVAs for the target's gender among all of the physical characteristics revealed that there were no significant differences between any of the characteristics (all *p*s > 0.05). On the other hand, follow-up univariate ANOVAs for the target's health status among all of the physical characteristics showed differences among the variables physically sickly/physically health, $F(2, 267) = 18.78$, $p < 0.001$, $\eta_p^2 = 0.12$; unattractive figure/attractive figure, $F(2, 267) = 9.12$, $p < 0.001$, $\eta_p^2 = 0.06$; unfit/fit, $F(2, 267) = 6.60$, $p < 0.01$, $\eta_p^2 = 0.05$; physically weak/physically strong, $F(2, 267) = 4.04$, $p < 0.05$, $\eta_p^2 = 0.03$; physically limited/physically liberated, $F(2, 267) = 12.71$, $p < 0.001$, $\eta_p^2 = 0.09$; and frail/sturdy, $F(2, 267) = 6.81$, $p < 0.01$, $\eta_p^2 = 0.05$.

To examine the specific differences on these physical ratings by health status (MI vs. arthritis vs. healthy control), Tukey post hoc follow-up tests were conducted. Post-hoc tests revealed that university students perceived the MI targets as being more physically sick ($p < 0.01$) and having a more unattractive figure ($p < 0.01$) when compared to individuals with arthritis. Post hoc tests also showed that MI targets were perceived as being more physically sick ($p < 0.01$), having a more unattractive figure ($p < 0.001$), being more unfit ($p < 0.001$), more physically weak ($p < 0.05$), more physically limited (*p*

< 0.001), and more frail ($p < 0.01$) when compared to the healthy controls. Lastly, the post hoc analyses demonstrated that individuals with arthritis were perceived as being more physically sick ($p < 0.01$), more physically limited ($p < 0.001$), and more frail ($p < 0.01$) when compared to healthy controls (see Table 7 for means and standard deviations).

Follow-up univariate ANOVAs for the participant's gender among the physical characteristics were then conducted. The results indicated differences among the characteristics of ugly/good looking, $F(1, 267) = 6.94$, $p < 0.01$, $\eta_p^2 = 0.03$; sexually unattractive/sexually attractive, $F(1, 267) = 5.63$, $p < 0.05$, $\eta_p^2 = 0.02$; scrawny/muscular, $F(1, 267) = 10.27$, $p < 0.01$, $\eta_p^2 = 0.04$; physically sickly/physically healthy, $F(1, 267) = 5.50$, $p < 0.05$, $\eta_p^2 = 0.02$; unattractive figure/attractive figure, $F(1, 267) = 8.00$, $p < 0.01$, $\eta_p^2 = 0.03$; unfit/fit, $F(1, 267) = 7.23$, $p < 0.05$, $\eta_p^2 = 0.02$; physically weak/physically strong, $F(1, 267) = 7.23$, $p < 0.01$, $\eta_p^2 = 0.03$; physically limited/physically liberated, $F(1, 267) = 8.27$, $p < 0.01$, $\eta_p^2 = 0.03$; and frail/sturdy, $F(1, 267) = 10.22$, $p < 0.01$, $\eta_p^2 = 0.04$. The male participants were found to rate the targets less favourably 9/10 physical characteristics when compared to the female participants (all ps < 0.05; see Table 8 for means and standard deviations).

Table 7

Means and standard deviations for the physical characteristics by target health status

	MI		Arthritis		Healthy Control	
Variable	Mean	SD	Mean	SD	Mean	SD
Ugly/good looking	5.65_{a}	1.22	5.75_{a}	1.40	5.89_{a}	1.47
Sexually unattractive/sexually attractive	5.15_{a}	1.44	5.15_{a}	1.65	5.23_{a}	1.72
Overweight/underweight	4.78_{a}	1.35	5.05_{a}	1.23	5.22_{a}	1.18
Scrawny/muscular	4.88_{a}	1.13	4.67_{a}	1.14	4.92_{a}	1.07
Physically sickly/physically healthy	4.66_{a}	1.66	5.35_{b}	1.46	6.13_{c}	1.30
Unattractive figure/attractive figure	4.76_{a}	0.95	5.27_{b}	1.29	5.55_{b}	1.26
Unfit/fit	4.55_{a}	1.42	5.03_{ab}	1.55	5.39_{b}	1.37
Physically weak/physically strong	4.73_{a}	1.38	4.79_{ab}	1.46	5.26_{b}	1.32
Physically limited/physically liberated	4.95_{a}	1.24	4.91_{a}	1.65	5.95_{b}	1.57
Frail/sturdy	5.19_{a}	1.35	5.14_{a}	1.48	5.81_{b}	1.45

*Note***.** Values in the same row that do not share a common subscript letter are significantly different. Higher mean scores correspond to more positive ratings of the physical characteristic pairs. All ratings are on a 9-point semantic differential scale.

Table 8

Means and standard deviations for the physical characteristics by participant's gender

	Male		Female	
Variable	Mean	SD	Mean	SD
Ugly/good looking	5.46**	0.34	5.91**	1.36
Sexually unattractive/sexually attractive	4.90*	1.67	5.36*	1.56
Overweight/underweight	5.07	1.45	4.99	1.16
Scrawny/muscular	4.52**	1.17	4.97**	1.06
Physically sickly/physically healthy	5.13*	1.57	5.51*	1.60
Unattractive figure/attractive figure	4.93**	1.21	5.33**	1.21
Unfit/fit	4.74*	1.47	5.12*	1.49
Physically weak/physically strong	4.62**	1.35	5.07**	1.41
Physically limited/physically liberated	4.93**	1.45	5.42**	1.61
Frail/sturdy	5.01**	1.37	5.56**	1.47

*Note***.** Higher mean scores correspond to more positive ratings of the physical characteristic pairs. All ratings are on a 9-point semantic differential scale. Significant between group differences, *$p < 0.05$ and **$p < 0.01$.

4.6.2 Data Analysis for Research Question Two

Two separate 2 (participant gender: male vs. female) x 2 (target gender: male vs. females) x 3 (exercise status: exerciser, non-exerciser vs. exercise controls) MANOVAs were conducted to examine whether participants perceive targets who have suffered an MI differently when they are described as exercisers, non-exercisers or exercise controls, one for personality and one for physical characteristics.

The first MANOVA was analyzed using the personality characteristics as the dependent measures. The results revealed a significant main effect for the target's exercise status, $F(42, 482) = 2.72$, $p < 0.001$, $\eta_p^2 = 0.19$, but no main effect for the target's gender, $F(21, 240) = 1.44$, $p = 0.10$, $\eta_p^2 = 0.11$, or participant gender, $F(21, 240) = 0.84$, $p = 0.67$, $\eta_p^2 = 0.07$. Additionally, the interactions between target gender and participant gender, $F(21, 240) = 1.13$, $p = 0.31$, $\eta_p^2 = 0.09$, target gender and target exercise status, $F(42, 482) = 1.07$, $p = 0.36$, $\eta_p^2 = 0.09$, and participant gender and target exercise status, $F(42, 482) = 0.89$, $p = 0.67$, $\eta_p^2 = 0.07$, were all found to be non-significant. The 3-way interaction between target gender, participant gender and target health status was also not significant, $F(42, 482) = 1.28$, $p = 0.15$, $\eta_p^2 = 0.10$.

Follow-up univariate ANOVAs were conducted for the target's exercise status on all of the personality characteristics. Results showed that there were significant differences among the ratings of lazy/works hard, $F(2, 260) = 8.50$, $p < 0.001$, $\eta_p^2 = 0.06$; lacks self-control/has self-control, $F(2, 260) = 4.60$, $p < 0.05$, $\eta_p^2 = 0.03$; passive/persevering, $F(2, 260) = 6.72$, $p < 0.01$, $\eta_p^2 = 0.05$; self-pitying/not self-pitying, $F(2, 260) = 7.85$, $p < 0.05$, $\eta_p^2 = 0.03$; gives up easily/persistent, $F(2, 260) = 16.57$, $p < 0.001$, $\eta_p^2 = 0.11$; helpless/self-reliant, $F(2, 260) = 10.62$, $p < 0.001$, $\eta_p^2 = 0.08$;

optimistic/pessimistic, $F(2, 260) = 7.50$, $p < 0.01$, $\eta_p^2 = 0.06$; and health conscious/not health conscious, $F(2, 260) = 21.18$, $p < 0.001$, $\eta_p^2 = 0.14$. In order to delve into the differences on these personality ratings by exercise status (exerciser, non-exerciser and exercise control), Tukey post-hoc follow-up tests were conducted. Post-hoc tests revealed that university students perceived individuals who exercise following an MI as harder workers ($p < 0.001$), having more self-confidence, ($p < 0.01$), more persevering ($p < 0.001$), less self-pitying ($p < 0.001$), more persistent ($p < 0.001$), more self-reliant ($p < 0.001$), more optimistic ($p < 0.001$), and more health conscious ($p < 0.001$), when compared to individuals who are non-exercisers following an MI. Post-hoc analyses also revealed that targets who were described as exercisers following an MI were perceived to be more persistent ($p < 0.01$), more self-reliant ($p < 0.01$), and more health conscious ($p < 0.001$), when compared to exercise controls. Additionally, follow-up analyses showed that individuals who were described as non-exercisers following an MI were perceived as more lazy ($p < 0.01$), lacking self-control ($p < 0.01$), more self-pitying ($p < 0.05$), gives up more easily ($p < 0.01$), and less health conscious ($p < 0.05$), when compared to exercise controls (See Table 9 for means and standard deviations).

Table 9

Means and standard deviations for the personality characteristics by exercise status analysis

	Exerciser		Non-Exerciser		Exercise Control	
Variable	Mean	SD	Mean	SD	Mean	SD
Mean/Kind	7.44_a	1.23	7.09_a	1.32	7.21_a	1.24
Few friends/many friends	6.13_a	1.71	6.27_a	1.47	5.93_a	1.75
Lazy/works hard	6.48_a	1.96	5.41_b	1.74	6.23_a	1.79
Afraid/brave	6.18_a	1.73	5.62_a	1.42	5.89_a	1.50
Unintelligent/intelligent	7.02_a	1.69	6.90_a	1.41	7.32_a	1.40
Sloppy/neat	6.27_a	1.84	6.22_a	1.52	6.28_a	1.52
Sad/happy	6.36_a	1.60	5.95_a	1.86	6.37_a	1.55
Lacks self-confidence/has self-confidence	6.37_a	1.63	5.84_a	1.60	6.07_a	1.56
Lacks self-control/has self-control	6.47_a	1.64	5.76_b	1.64	6.50_a	1.47
Unsociable/sociable	6.93_a	1.85	6.75_a	1.71	6.96_a	1.58
Dependent/independent	6.88_a	1.62	6.61_a	1.47	6.81_a	1.39
Not friendly/friendly	7.43_a	1.49	7.32_a	1.14	7.39_a	1.41
Passive/persevering	6.74_a	1.80	5.78_b	1.51	6.20_b	1.55
Incompetent/competent	6.84_a	1.74	6.85_a	1.24	6.99_a	1.37
Self-pitying/no self-pitying	6.92_a	1.76	5.88_b	1.62	6.50_b	1.64
Gives up easily/persistent	7.12_a	1.82	5.58_b	1.73	6.34_c	1.67
Helpless/self-reliant	7.18_a	1.63	6.14_b	1.46	6.38_b	1.62
Calm/angry	6.26_a	1.80	5.69_a	1.71	6.00_a	1.88
Optimistic/pessimistic	6.46_a	1.98	5.35_b	1.59	5.98_a	1.88
Health conscious/not health conscious	6.31_a	2.12	4.10_b	2.12	4.80_b	1.74
Stressed/not stressed	5.03_a	1.63	4.87_a	1.84	4.91_a	1.72

*Note***.** Values in the same row that do not share a common subscript letter are significantly different. Higher mean scores correspond to more positive ratings of the personality characteristic pairs. All ratings are on a 9-point semantic differential scale.

The second MANOVA was analyzed using the physical characteristics as the dependent variables. The results revealed a statistically significant main effect for target gender, $F(10, 259) = 1.97$, $p < 0.05$, $\eta_p^2 = 0.07$, and target exercise status, $F(20, 520) = 4.03$, $p < 0.001$, $\eta_p^2 = 0.13$, but not for the main effect of participant gender, $F(10, 259) = 1.97$, $p = 0.05$, $\eta_p^2 = 0.07$. Additionally, the interactions between target gender and participant gender, $F(10, 259) = 1.30$, $p = 0.23$, $\eta_p^2 = 0.05$, target gender and target exercise status, $F(20, 520) = 1.38$, $p = 0.13$, $\eta_p^2 = 0.05$, and participant gender and target exercise status, $F(20, 520) = 0.82$, $p = 0.69$, $\eta_p^2 = 0.03$, were all found to be statistically non-significant. The 3-way interaction between target gender, participant gender and target exercise status was also found to be non-significant, $F(20, 520) = 0.94$, $p = 0.53$, $\eta_p^2 = 0.04$.

Follow-up univariate ANOVAs were conducted for the target's exercise status (exerciser, non-exerciser and exercise control) on all of the physical characteristics. The results showed that there were significant differences among the ratings of physically sickly/physically healthy, $F(2, 268) = 16.06$, $p < 0.01$, $\eta_p^2 = 0.11$; unattractive figure/attractive figure, $F(2, 268) = 3.83$, $p < 0.05$, $\eta_p^2 = 0.03$; unfit/fit, $F(2, 268) = 21.81$, $p < 0.001$, $\eta_p^2 = 0.14$; physically weak/physically strong, $F(2, 268) = 19.58$, $p < 0.001$, $\eta_p^2 = 0.13$; physically limited/physically liberated, $F(2, 268) = 20.30$, $p < 0.001$, $\eta_p^2 = 0.13$; and frail/sturdy, $F(2, 268) = 9.08$, $p < 0.001$, $\eta_p^2 = 0.06$. To distinguish the differences in the physical ratings by exercise status (exerciser, non-exerciser and exercise control), Tukey post-hoc follow-up tests were conducted. Post-hoc tests determined that university students perceived targets who exercise following an MI as being more physically healthy ($p < 0.001$), more fit ($p < 0.001$), more physically strong ($p < 0.001$), more

physically liberated ($p < 0.001$), and more sturdy ($p < 0.001$), when compared to targets who do not exercise following an MI. Additionally, Tukey post-hoc follow-ups showed that targets who exercised following an MI were perceived as being more physically healthy ($p < 0.001$), more fit ($p < 0.001$), more physically strong ($p < 0.001$), more physically liberated, ($p < 0.01$), and more sturdy ($p < 0.01$), when compared to the exercise controls. Follow up analysis also revealed that targets who were non-exercisers following an MI were perceived as being more unfit ($p < 0.01$), more physically weak ($p < 0.05$), and more physically limited ($p < 0.01$) when compared to exercise controls (See Table 10 for all means and standard deviations).

Next, follow-up univariate ANOVAs were conducted for the target's gender among all of the physical characteristics. Results demonstrated that there were significant differences among the ratings of overweight/underweight, $F(1, 268) = 5.69$, $p < 0.05$, $\eta_p^2 = 0.02$, physically sickly/physically healthy, $F(1, 268) = 5.38$, $p < 0.05$, $\eta_p^2 = 0.02$, and unattractive figure/attractive figure, $F(1, 268) = 5.81$, $p < 0.05$, $\eta_p^2 = 0.02$. Male targets were perceived as being more overweight ($M = 4.48$, $SD = 1.55$) compared to female targets ($M = 4.67$, $SD = 1.32$), more physically sickly ($M = 4.73$, $SD = 1.75$) compared to female targets ($M = 4.91$, $SD = 1.67$), and having a less attractive figure ($M = 4.66$, $SD = 1.32$) compared to female targets ($M = 5.01$, $SD = 1.19$).

Table 10

Means and standard deviations for the physical characteristics by participant's exercise status

	Exerciser		Non-Exerciser		Exercise Control	
Variable	Mean	SD	Mean	SD	Mean	SD
Ugly/good looking	5.40_a	1.43	5.38_a	1.30	5.65_a	1.22
Sexually unattractive/sexually attractive	5.18_a	1.60	5.21_a	1.27	5.15_a	1.44
Overweight/underweight	4.53_a	1.46	4.52_a	1.37	4.78_a	1.35
Scrawny/muscular	5.13_a	1.24	4.79_a	1.13	4.88_a	1.13
Physically sickly/physically healthy	5.66_a	1.56	4.26_b	1.56	4.66_b	1.66
Unattractive figure/attractive figure	5.17_a	1.46	4.76_b	1.22	4.76_b	0.95
Unfit/fit	5.45_a	1.69	3.76_b	1.47	4.55_c	1.42
Physically weak/physically strong	5.59_a	1.50	4.10_b	1.45	4.73_c	1.38
Physically limited/physically liberated	5.74_a	1.77	4.24_b	1.67	4.95_c	1.24
Frail/sturdy	5.89_a	1.51	4.88_b	1.73	5.19_b	1.35

*Note***.** Values in the same row that do not share a common subscript letter are significantly different. Higher mean scores correspond to more positive ratings of the physical characteristic pairs. All ratings are on a 9-point semantic differential scale.

CHAPTER 5: DISCUSSION

The present study investigated the impressions that university students formed of others, based on information about health status. Specifically, this study first sought to determine whether university students perceived individuals described as having had an MI (MI targets) differently on a variety of personality and physical characteristics from those with either a different health condition (arthritis targets) or no illness at all (healthy control targets). The second purpose of this study was to examine if participants perceived MI targets who were described as exercisers more positively than MI targets who were described as either non-exercisers or exercise controls (where no exercise habits were mentioned).

It was first hypothesized that the MI target would be rated more negatively on personality and physical characteristics when compared to the healthy control target and the arthritis target, regardless of the participant or target gender. Consistent with this hypothesis, the results of this study found that the MI targets were rated more negatively on 1/21 personality ratings and on 6/10 physical ratings when compared to the healthy control targets (no health condition). These results showed that negative perceptions towards individuals who have had an MI were more heavily weighted on the physical characteristics. Also consistent with the hypothesis, the MI targets were rated more negatively on 2/21 personality ratings and on 2/10 physical ratings when compared to the arthritis targets. These results occurred regardless of the participant's and target's gender, as evidenced by the lack of significant gender by health status interaction. On the other hand, the interaction between the target's gender and the participant's gender was found to influence the impressions being formed on personality characteristics. Specifically, the

male participants rated the male targets more negatively than the female targets on three personality characteristics, and the female participants rated the male targets more negatively than the female targets on one personality characteristic. The participant's gender was also found to influence impression formation on the physical characteristics, with the male participants perceiving the targets more negatively than the female participants.

For the second purpose of this study, it was hypothesized that targets who were described as exercisers following an MI would be perceived more positively than the targets who were described as non-exercisers following an MI or the exercise control targets (for whom no exercise habits were mentioned). This was hypothesized to occur regardless of the participant's gender or target's gender. Consistent with this hypothesis, the results of this study found that the MI exercisers were perceived more favourably on 8/21 personality ratings and on 5/10 physical ratings when compared to the MI non-exercisers. The MI exercisers were also perceived more favourably on 3/21 personality ratings and on 5/10 physical ratings when compared to the MI exercise control targets. Consistent with the hypothesis and previous research, the results of this study found that the participant's gender and target's gender did not influence the impressions formed of exercisers compared to non-exercisers (Arbour et al., 2007; Greenlees et al., 2007; Kite et al., 2005; Lindwall & Martin Ginis, 2006; Martin Ginis et al., 2003). On the other hand, the target's gender did affect impression formation as a whole for the physical ratings. Specifically, the male targets were perceived more negatively on 3/10 physical characteristics compared to the female targets.

5.1 Hypothesis One: Health Status

5.1.1 Impressions Formed of MI Targets

The results of this study were consistent with the hypothesis, indicating that university students perceived targets who had an MI differently from targets with arthritis and healthy control targets. As predicted, the MI targets were rated more negatively on a variety of physical and personality characteristics when compared to both the healthy control targets and the targets with arthritis.

The MI targets were found to be perceived less favourably than the healthy control targets, although specifically on the physical characteristics. The MI targets were perceived less favourably on six of the 10 physical characteristics: being more physically sick, having a more unattractive figure, being more unfit, more physically weak, more physically limited and being more frail when compared to the healthy control targets. The prevalence of unfavourable ratings on physical characteristics is consistent with Davison and colleagues (1991), who looked at perceptions of CAD patients. This study found that physical characteristics such as obesity, red facial complexions, being a non-exerciser, having heavy breathing, and excessive perspiration were associated with CAD (Davison et al., 1991). These results suggest that lay perceptions towards CAD and MI are based, at least in part, on simple judgements about physical appearance, rather than personality traits.

However, the present study also found that MI targets were perceived less favourably on one personality characteristic compared to the healthy control targets. The MI targets were perceived as being more stressed compared to the healthy controls, which is also similar to the results of Davison and colleagues (1991). Davison and

colleagues (1991) found that individuals strongly perceived mental stress (e.g., responsibility/decision making, production pressure, etc) to be associated with CAD. Previous research has found that stress has a major impact upon the circulatory system, and plays a significant role in the susceptibility, progress, and the outcome of CAD (Esch, Stefano, Fricchione, & Benson, 2002). Therefore the perception of MI patients being more stressed is consistent with research, and indicates that university students may be aware of the risk factors of MIs. On the other hand, Davison and colleagues (1991) found that CAD patients were also perceived as being angry and pessimistic. In the present study, there was no statistically significant difference between the MI targets and the healthy control targets on these two characteristics (i.e., angry and pessimistic). One reason for the differences in ratings between Davison and colleagues (1991) and the present study may be that perceptions have changed over the last decade. It is possible that there is a greater understanding of MIs in today's society compared to 1991. Another reason for these differences may be the use of different samples. Davison and colleagues (1991) investigated lay perceptions of individuals in a rural area, whereas the present study investigated university students' perceptions.

The majority of the students (75%) in the present study were seeking health-related degrees (e.g., kinesiology, biomedical sciences, health sciences, etc.), and therefore may have displayed a greater understanding of MIs compared to the average person. The use of this sample may explain why only 1/21 personality ratings was perceived negatively for the MI target. Since the majority of the sample consisted of students seeking health-related degrees, it is likely they have gained knowledge regarding MIs, mitigating incorrect assumptions and stigmas towards this population. In fact,

previous research has shown that education can diminish negative perceptions by providing contradictory information (Rusch, Angermeyer, & Corrigan, 2005). Therefore, students or individuals who have been educated on MIs may be less likely to develop prejudices towards individuals who have had an MI. On the other hand, research using non-health-related students showed that CAD patients were perceived to be more pessimistic, incompetent, and more dependent compared to healthy individuals (Davison et al., 1991). The present study did not reveal any significant differences between the MI targets and the healthy control targets on these specific personality characteristics (or others). Therefore, it is possible that a different sample (students in non-health related degrees or adults in non-health related fields) may report different perceptions towards those who have had an MI.

Additionally, it is possible that the sample used in this study had unique perceptions towards MIs that may not be held by the general public. Teachman and Brownell (2001) found that the negative perceptions held by health care professionals towards overweight individuals were strong, but were not as negative as the perceptions held by the general population. This is because people who are aware and knowledgeable regarding illnesses hold less negative perceptions towards those illnesses (Katz et al., 1987; Teachman & Brownell, 2001). Based on these findings, it is possible that students in health-related fields in the present sample formed less negative stereotypes towards those who have had an MI compared to the general population. Therefore, it is likely that individuals in the general population hold more negative perceptions of individuals who have had an MI compared to the results found in the present study.

5.1.2 Impressions Formed of Arthritis Targets

The arthritis target was used in this study to verify that any differences between the MI target and the healthy control target were attributable to the MI itself, and not due to a health condition in general. In other words, if the participants perceived the MI targets more negatively than both the healthy control and the arthritis group, this would suggest that people tend to form more negative impressions of those who have had an MI specifically. Alternatively, if the MI targets and the arthritis targets were both rated more negatively than the healthy control, with no differences between the MI and arthritis targets, this would suggest that people tend to form more negative impressions of individuals who are unhealthy in general.

The present study hypothesized that the MI targets would be perceived more negatively on physical and personality characteristics when compared to the arthritis target, regardless of the participant or target's gender. The results of the present study provided some support for our hypothesis, indicating that the MI targets were rated more negatively on 2/10 physical ratings (more physically sick and having a more unattractive figure) and 2/21 personality ratings (gives up more easily and less health conscious) when compared to the arthritis targets. The results also found that the arthritis targets were perceived more negatively on 3/10 physical characteristics (more physically sick, more physically limited and more frail) when compared to the healthy control targets. Interestingly, the results of this study also found that the arthritis targets were perceived more positively on one of the personality characteristic (being more health conscious) when compared to the healthy control targets. These results indicate that people form negative impressions of individuals who have had rheumatoid arthritis, but not to the

same extent of the negative impressions formed of those who have had an MI. Therefore, negative perceptions were held towards individuals who are considered unhealthy or ill in general (MI and arthritis), but the degree of negativity and specific dimensions are dependent on the type of health condition and potentially the nature of the health condition.

These results are similar with Katz and colleagues (1987), revealing that people tend to form more negative perceptions of those with a health condition in general, but the degree of negativity varied from illness to illness. For instance, Katz and colleagues (1987) found that college students, nurses, medical students and chiropractor students generally had more negative perceptions of those with AIDS, cancer, diabetes and heart disease when compared to 'most people' (Katz et al., 1987). This is consistent with a variety of other studies suggesting negative perceptions, stereotypes or stigmas towards individuals who are considered to be unhealthy, or have a health condition/illness (Cooper, Bean, Alpert, & Baum, 1980; Davison et al., 1991; Price, Hillman, Toral, & Newell, 1983).

Although these studies have established that people hold negative perceptions towards individuals with health conditions, they have also found that certain health conditions are perceived more negatively then others. For example, Katz and colleagues (1987) found that all groups with health condition were perceived more negatively than the healthy control condition, but the cancer patients were perceived less favourably when compared to the diabetic and heart disease patients. Similarly, the present study found that both health conditions (MI and arthritis) were perceived more negatively than the healthy control, but the MI patient was perceived less favourably compared to

someone with arthritis. For instance, when compared to the healthy control targets, the present study found that the MI targets were perceived much more negatively (6/10) on the physical characteristics, whereas the arthritis targets were perceived more negatively on fewer characteristics (2/10). Therefore, these results suggest that unhealthy individuals are generally perceived more negatively, but the degree of negativity is dependent on the type of health illness.

One explanation for arthritis being perceived more favourably than MIs may be due to an accurate understanding of rheumatoid arthritis. The accurate understanding of arthritis may be reflective of the sample used in this study (health-related students). Although there are a variety of different arthritis conditions (e.g., osteoarthritis, gout, psoriatic arthritis, septic arthritis, etc.), it is possible that rheumatoid arthritis is accurately perceived as a health condition that is not believed to be inflicted by oneself, but is rather a health condition that affects people at random or is genetic in origin. On the other hand, MI targets may be blamed for their conditions as the result of poor lifestyle choices. For example, the MI targets in this study were perceived as being physically sick, having an unattractive figure, being unfit, physically weak, physically limited and frail. Similarly, Davison and colleagues (1991) found those with CAD to be perceived as fat, red-faced, inactive individuals with an unhealthy diet. The majority of these characteristics are generally considered to be controllable, and are explicitly associated with physical inactivity, unhealthy diet, and obesity (Hernandez et al., 1999; Lahti-Koski, Piertinen, Heliovaara, & Vartiainen, 2002). Thus, individuals may perceive health conditions that are potentially preventable (or are seen as more controllable), such as an MI, more negatively, because they believe such health conditions are inflicted by poor lifestyle

choices (Crandall, 1994). This is important, because individuals who have health conditions that are believed to be inflicted by him or herself may be treated poorly. For example, Teachman and Brownell (2001) found that health care professionals who blamed their patients for their obesity had negative perceptions of their patients which in turn influenced their professional behaviours. Similarly, Crandall (1994) found that being overweight was deemed as blameworthy, because it was thought to be a controllable health condition. Therefore, efforts should be made to reduce the assumption that certain health conditions are inflicted upon oneself, because this is not always the case (e.g., genetics, environmental factors such as second hand smoke, etc.).

5.1.3 Target and Participant Gender Interaction Influencing Impressions Formed of Targets

The results of this study found an interaction between the target's gender and the participants' gender that influenced the perceptions formed of the MI targets, the arthritis targets and the healthy control targets (as one unified group). The target's gender and the participant's gender influenced the ratings on the personality characteristics, but not the physical characteristics. The results showed that the male participants rated the male targets as being less intelligent, more dependent, and more helpless compared to the female targets. The results also showed that the female participants rated the male targets as being more sloppy compared to the female targets, suggesting that the participants (both male and female) in this study had different preconceived perceptions of other males and females. Therefore, the results indicated that the male targets were perceived more negatively compared to the female targets by both the male participants and female participants, but the male participants perceived the male targets more negatively than the

female participants. These results are consistent with Eagly, Mladinic, and Otto (1991) and Shields and colleagues (2007), who also found that male targets were perceived negatively by both males and females. Specifically, Shields and colleagues (2007) found that the young adult male participants perceived the young adult male targets more negatively than the young adult female participants. These findings may highlight the importance of expected social roles in how we present ourselves. These social roles are often gender-specific, and lead individuals to act in certain ways that are consistent with their social roles. For instance, Shields and colleagues (2007) suggested that males perceived exercise as a more important role for men to carry out than do female participants. If social roles are not carried out, it can result in negative reactions. In the present study, it is possible that participants may have believed that targets with a health condition (i.e., arthritis or MI) are more physically weak and limited. As a result, the male participants may have perceived the male targets more harshly than the female participants, because the male target deviated from the social desirable role for men to be physically active and healthy.

Additionally, as mentioned, people may have different preconceived perceptions or attitudes towards males and females. For example, Eagly and Mladinic (1989) were interested in attitudes towards genders, and found that male participants held less favourable attitudes towards the males compared to the females. It is possible that men are harder on their male counterpart because they are less nurturing and do not perceive others in a positive light (Cole, Jayaratne, Cecchi, Feldbaum, & Petty, 2007). Research has in fact shown that females are generally seen as kind, helpful, warm and understanding individuals (Eagly & Mladinic, 1989), and are thus less likely to perceive

others in a negative light. It is therefore possible that women are less likely to form negative judgements of others, because they are naturally more nurturing and caring towards others.

It is also possible that the male participants were rating their male counterparts as being unintelligent, helpless and dependent, because they believed that the male targets in this specific description were less masculine. Some of the description within the target description, such as playing the guitar or being a history teacher, may have led the male participants to perceive the male targets as being less masculine.

5.1.4 Participant Gender Influencing Impressions Formed of Targets

In general, research has shown that the participants' gender does not influence impression formation (Kite et al., 2005; Johnstone & Rickards, 2006). As a result, a variety of studies examining impression formation have omitted participant gender from the main analysis (Arbour et al., 2007; Drouin et al., 2008; Greenlees et al., 2007; Linwall & Martin Ginis, 2006; Martin, Sinden, et al., 2000; Martin Ginis et al., 2003; Martin Ginis & Leary, 2006). The participants' gender was included in the present study because a few studies have showed participant gender influences impression formation (Shields et al., 2007), with one investigating impressions formed of unhealthy individuals (e.g., overweight targets; Harris, Walters & Waschull, 1991).

The results of the present study showed that the male participants rated the targets (male and female targets) more negatively on 9/10 physical characteristics, compared to the female participants rating the same targets. One explanation for these findings may be that males perceive others more negatively than females. In fact, researchers have found in a variety of different cultures that women are naturally more nurturing than men (Cole,

et al., 2007). As a result, it is possible that women form less negative perceptions of others compared to men, because they are more caring and understanding towards individuals, especially those with health conditions (i.e., MIs and arthritis). Additionally, it is possible that males have different preconceived perceptions of those with a health condition than women, suggesting that men may hold stronger stereotypes towards others compared to women.

5.2 Hypothesis Two: Exercise Status

The second purpose of this study was to determine if individuals who were described as exercisers following an MI were perceived more positively than individuals who were described as non-exercisers following an MI or the MI control targets (where no exercise habits were mentioned). The results of the present study were consistent with our hypothesis, indicating that the MI exercisers were perceived more favourably on a variety of personality and physical ratings when compared to the MI non-exercisers and the MI exercise control targets. These results occurred regardless of the participant's and target's genders (i.e., no interaction effects emerged).

5.2.1 MI Exercisers vs. Non-Exercisers

Consistent with the hypothesis, the results of this study found that individuals who were described as exercisers following an MI were perceived more positively on personality and physical characteristics when compared to individuals who were described as non-exercisers following an MI. The exercising targets were perceived more favourably on 8/21 personality characteristics and on 5/10 physical characteristics when compared to the non-exercisers.

In regards to the personality characteristics, the exercisers were perceived to be harder working, more self-confident, more persevering, less self-pitying, more persistent, more self-reliant, more optimistic, and more health conscious when compared to the non-exercising targets. These results show that individuals who exercise following an MI are perceived more positively on a variety (8/21) of personality characteristics, including those that are completely unrelated to physical activity (e.g., being less self-pitying and optimistic) These results are similar to Arbour and colleagues who found that exercising following a spinal cord injury was perceived more positively on 14/17 personality characteristics when compared to the individuals who did not exercise following a spinal cord injury. Of these significant 14 personality characteristics, six were identical to the significant eight personality characteristics in the present study. Interestingly, the remaining eight significant personality characteristics that were perceived more positively for exercisers in Arbour and colleagues (2007) were not apparent for the MI exercisers in the present study. In fact, the majority of previous research examining the influence of exercise behaviours on impression formation has found that exercisers were perceived more positively on at least half or more personality characteristics (Greenlees et al., 2007; Lindwall & Martin Ginis, 2010; Martin Ginis and Leary, 2006; Martin Ginis et al., 2003). In the present study, less than half of the personality characteristics emerged more positively for the exercisers when compared to the non-exercisers. Thus, it appears that exercise helps to promote more positive perceptions for individuals who have had an MI, but maybe not to the extent that it has been shown in other populations, such as younger adults and those with a spinal cord injury. These results may suggest that the positive exerciser stereotype does not promote equally positive perceptions across all populations.

In regards to the physical characteristics, the exercisers were perceived to be more physically healthy, more fit, more physically strong, more physically liberated, and more sturdy when compared to targets who did not exercise following an MI. Similarly, Arbour and colleagues (2007) found the same five characteristics to emerge more positively for individuals who exercise following a spinal cord injury when compared to the individuals who did not exercise following an spinal cord injury. Accordingly, these studies both found that the participants perceived the exercisers more positively on characteristics that were associated with being physically active, indicating that the sample used in this study was aware of the physical benefits of exercise. Benefits of exercise include (but are not limited to) being more healthy, fit and strong, which consequently leads to being more physically liberated and sturdy (Fletcher et al., 1996; Warburton, Nicol, & Bredin, 2006). Thus, since the majority of the participants in this sample were from health-related degrees, it is likely that they are educated on the benefits associated with exercise and refrained from focusing on characteristics unrelated to exercise (e.g., good looking, having lots of friends).

The results of this study found that characteristics of physical attractiveness (e.g., good looking, sexually attractive, attractive figure, etc.) did not emerge for the exercisers. These findings are inconsistent with previous research, where exercisers were generally perceived more positively on the majority of physical characteristics (at least 80%), including those that are related to physical attractiveness, when compared to non-exercisers (Arbour et al., 2007; Faulkner et al., 2007; Greenlees et al., 2007; Martin Ginis et al., 2003; Martin, Sinden, et al., 2000; Lindwall & Martin Ginis, 2006). For example, all of these studies showed that exercisers were perceived as being more good looking

and having a more attractive figure when compared to the non-exercisers, with the exception of Faulkner and colleagues (2007) who only showed exercisers to have a more attractive figure. Therefore, whether or not an individual who has had an MI exercises or not, he/she may not be perceived as being more physically attractive than non-exercisers. These findings may have occurred because the negative perceptions towards individuals who have had an MI were initially more focused on characteristics of being physically unfit (e.g., physically weak and frail), and physically unattractive (e.g., having an unattractive figure). It is possible that the negative impressions associated with an MI may have counteracted the positive perceptions associated with being an exerciser, at least in terms of physical attractiveness. Additionally, perceptions of physical attractiveness may not have been found for the exercisers because the sample used in the present study is more knowledgeable about the health related benefits associated with exercise. As a result, these participants did not associate characteristics of attractiveness with physical activity, because they were focused on the health benefits (e.g., being strong and healthy; Lindwall & Martin Ginis, 2006).

Overall, the results of this study showed that exercise can help buffer the negative perceptions towards individuals who have had an MI, but only to a certain extent. Exercising will create more favourable impressions for characteristics related to exercise (e.g., being strong), but not characteristics related to physical attractiveness (e.g., being good looking) for individuals who have had an MI. Although these findings are inconsistent with the majority of studies conducted with North American students (Faulkner et al., 2007; Martin, Sinden, et al., 2000; Martin Ginis & Leary, 2006; Shields et al., 2007), Lindwall and Martin Ginis (2006) and the present study found that there

were no significant effects noted on attributes associated with physical appearance (e.g., ugly/good looking, etc).

5.2.2 MI Exercisers vs. Exercise Controls

Also consistent with the hypothesis, the MI targets who were described as exercisers were perceived more positively than the MI targets for whom no exercise information was provided. The exercisers were perceived more positively on three personality characteristics and six physical characteristics when compared to the controls. These results indicate that the positive exerciser stereotype emerged for individuals who have had an MI.

With respect to the personality characteristics, the exercisers were perceived as being more persistent, more self-reliant, and more health conscious compared to the exercise controls, revealing a slightly more positive perception towards those who exercise. Similarly, Arbour and colleagues (2007) found that spinal cord injury patients who exercise were perceived as being more persistent and more self-reliant, along with many other characteristics, compared to the control targets (control targets being those with a spinal cord injury and no mention of exercise). Therefore, two of the same personality characteristics (being persistent and self-reliant) emerged more positively in both the present study and Arbour et al. (2007) for the exercisers compared to the controls. These results suggest that exercising following a health condition can promote positive perceptions on personality characteristics, related to effort and independence.

Interestingly, the results of Arbour and colleagues (2007) found that 13/17 personality characteristics were perceived more positively for the exercisers compared to the controls, whereas the present study had the same 17 personality characteristics within

the target rating scale as those in Arbour and colleagues (2007), but found only 3/21 personality characteristics to emerge more positively than the control targets. One explanation for this finding may be that exercise is simply seen as a more favourable behaviour when performed by individuals with a spinal cord injury than individuals who have had an MI. It is possible that exercising following an MI is an expected behaviour for an MI patient, as doctors tend to prescribe regular exercise following an MI (Fletcher et al., 1996). On the other hand, exercising following a spinal cord injury may be perceived more positively, because there are a variety of significant barriers that these individuals need to overcome in order to exercise (e.g., resources/cost or structural or architectural barriers). Additionally, research has indicated that physicians are less likely to prescribe exercise to their spinal cord injury patients (Scelza, Kalpakjjan, Zemper, & Tate, 2005). Exercising following a spinal cord injury may therefore be seen as a more favourable or inspired behaviour compared to exercising following an MI.

The results of this study also showed that the MI exercisers were perceived more favourably on a variety of physical characteristics when compared to the MI exercise controls. The MI exercisers were perceived as being more physically healthy, fit, strong, liberated, and sturdy when compared to the MI exercise controls (where no exercise habits were mentioned). This is also consistent with Arbour and colleagues (2007), who found that those who exercise following a spinal cord injury were perceived as being more physically fit, strong, liberated, and healthy when compared to the spinal cord injury controls (no exercise habits mentioned). Together, these studies suggest that exercisers are perceived as being more physically fit, as they are perceived to acquire the physical benefits associated with exercise (e.g., more healthy, strong, fit, etc.).

Neither the present study nor Arbour and colleagues (2007) found differences on characteristics of physical attractiveness, such as being good looking or having an attractive figure, for the exercisers when compared to the control targets. This is also consistent with two studies in Sweden (Lindwall & Martin Ginis, 2006; Lindwall & Martin Ginis, 2010), showing that physical characteristics related to attractiveness (e.g., good looking, sexually attractive, attractive figure, etc.) may not always be associated with being an exerciser. In contrast, the majority of Canadian and American studies have found that exercisers are perceived as being more physically attractive compared to controls (Faulkner et al., 2007; Greenlees et al., 2007; Martin, Sinden, et al., 2000; Martin Ginis et al., 2006; Shields et al., 2007). For example, Greenlees and colleagues (2007) and Martin, Sinden, and colleagues (2000) found that exercisers were perceived as being more sexually attractive than controls, Faulkner and colleagues (2007) and Martin, Sinden, and colleagues (2000) found that exercisers were perceived to have a more attractive figure than controls, and Shields and colleagues (2007) found that exercisers were perceived as being better looking, more sexually attractive, and having a more attractive figure compared to controls. As previously mentioned, it is possible that characteristics of physical attractiveness did not emerge in the present study because of the pre-existing negative perceptions towards MIs One explanation for these findings may be that the negative perceptions of health conditions (e.g., an MI) partially offsets the positive perceptions associated with exercise information for appearance related qualities. For example, the present study found that MI targets were perceived as having an unattractive figure, but when they were described as exercisers it helped to reduce this negative perception, but did not create a positive perception (i.e., they were no longer

perceived as having an unattractive figure, but they were not perceived as having an attractive figure).

In line with the positive exerciser stereotype hypothesis (Martin Ginis et al., 2003), individuals who have had an MI who were described as exercisers were rated more favourably than the exercise control and non-exercising targets on personality and physical characteristics. These findings suggest that exercise may be an effective strategy for people who have had an MI to overcome the negative stereotypes that were found to exist towards MIs. Accordingly, it may be useful to encourage individuals who have had an MI to engage in exercise not only for the health benefits but also for the self-presentational benefits of being an exerciser.

5.2.3 MI Non-Exercisers vs. Exercise Controls

In contrast to the positive influence of the exerciser stereotype on managing negative impressions found in this study, the results also highlight the potential damaging effects of physical inactivity on others' perceptions of those who have had an MI. The data suggests that there are self-presentational liabilities associated with being a non-exerciser. Participants in this study rated the MI targets who were described as non-exercisers more negatively on 5/21 personality and on 3/10 physical characteristics when compared to the exercise control targets (no exercise habits mentioned). For the personality characteristics, the non-exercisers were perceived as being more lazy, lacking self-control, self-pitying, giving up more easily, and less health conscious compared to the exercise controls. In regards to the physical characteristics, the non-exercisers were perceived as being more unfit, physically weak, and physically limited compared to the exercise controls. So these results revealed a negative non-exercising stereotype, as the

non-exercisers were perceived more negatively than both the exercisers and exercise controls. These results are consistent with other research (Arbour et al., 2007; Lindwall & Martin Ginis, 2006; Martin, Sinden, et al., 2000) finding non-exercising targets to be perceived more negatively than the control targets. For example, Arbour and colleagues (2007) found that the individuals who were described as non-exercisers following a spinal cord injury were perceived more negatively compared to the spinal cord injury controls (where no exercise habits mentioned). The results of Arbour and colleagues (2007) and the present study suggest that presenting sedentary behaviour information to others may inadvertently exacerbate negative stereotypes prevalent in such populations. These negative perceptions towards non-exercisers may reflect the negative stereotypes and discriminations of certain groups (e.g., individuals who have had an MI) that apparently do not live up to the moral obligations of a healthy life (White, Young, & Gillet, 1995).

5.2.4 The Influence of Target Gender on Impression Formation

While examining the effects of exercise status on impression formation, the results revealed that the target's gender influenced impression formation. Consistent with our hypothesis and previous research, the exercise stereotype emerged regardless of the target's gender, but overall the participants perceived the male targets as being more overweight, more physically sick, and having a less attractive figure when compared to the female targets.

Previous research examining impression formation of exercise have generally found no differences between the target's gender (Hodgins, 1992; Martin, Sinden, et al., 2000). A variety of studies have subsequently disregarded target gender (Lindwall &

Martin Ginis, 2006; Lindwall & Martin Ginis 2010; Martin Ginis, et al., 2003; Martin Ginis & Leary, 2006), because prior research indicated no differences. Therefore, it is possible that target gender might have influenced the participants' perceptions in these studies if it had been examined, but for now its influence remains unclear.

Although the majority of research has omitted the use of target gender, some studies have included target gender and found significant differences (Arbour et al., 2007; Mack, 2003). For example, Arbour and colleagues (2007) found a significant interaction between the target's exercise status and gender, with the female exercisers being perceived more positively on personality characteristics than the male exercisers. On the other hand, a couple of studies have also found a main effect for target gender, indicating that people have different perceptions of males and females in general (Eagly et al., 1991; Greenless et al., 2007; Mack, 2003; Martin, Sinden et al., 2000). For example a study by Mack (2003) found a significant main effect for gender on personality characteristics. This study found that females were rated more positively on 8/12 personality dimensions compared to males: more independent, self-confident, braver, harder working, happier, kinder, neater, and having more self-control. Martin, Sinden, and colleagues (2000) found that female targets were perceived more positively than male targets, although only on the variable of physical attractiveness. Greenless and colleagues (2007) also found that older female targets were perceived more positively on 6/13 physical characteristics compared to older male targets. Overall, these results indicate that females and males are generally perceived differently, which is consistent with previous research (Eagly et al., 1991; Eagly & Mladinic, 1989).

The present study concluded that the participants perceived the male targets less favourably than the female targets on physical characteristics. Therefore, consistent with previous research (Eagly et al., 1991; Eagly & Mladinic, 1989; Greenless et al., 2007; Mack, 2003; Martin, Sinden et al., 2000), men were not perceived as positively as women, suggesting that people do not generally perceive males as favourably as females.

These results may indirectly suggest that participants still believe heart disease is predominantly a male issue. According to Maas and Appelman (2010), the risk of heart disease is often underestimated in women due to the misperception that females are 'protected' against CAD. Given that MIs have been stereotyped as a man's disease, negative perceptions associated with MIs may likely be more associated with men than women, thus explaining the participants' negative perceptions towards the male targets. Therefore, the male and female participants may have perceived the male targets more harshly than the female participants because they believe that MIs are a man's disease.

5.3 MIF Questionnaire

Participants' familiarity with an MI was investigated to determine if knowing someone who had an MI was related to how targets who were described as having an MI were perceived, and to determine if participants who had an MI themselves perceived the MI targets more positively than the participants who did not have an MI. The first research question was based on previous research showing that participants who were more knowledgeable about obesity were less biased towards the obese (Teachman, Gapinski, Brownell, Rawlins, & Jeyaram, 2003), Therefore, it was hypothesized that participants who reported knowing someone who had an MI would be more knowledgeable about this health condition and be less likely to form negative perceptions

of MIs. The second question was examined because previous research has shown that individuals who share similar characteristics with other people tend to perceive those people more favourably (Tajfel & Turner, 1979). Social identity theory (Taijfel & Turner, 1979) suggests that people who are similar to others tend to perceive these individuals positively because they believe they belong to the same group. In attempts to increase the status of the group to which they belong, they perceive others within that same group positively (Taijfel & Turner, 1979).

The results of the present study showed that personally knowing someone who had an MI was unrelated to the impressions that were formed of the MI targets. Only one relationship was found among the personality variables, unintelligent/intelligent, and this relationship was very small. Interestingly, this relationship was negative, indicating that participants who reported knowing someone who had an MI perceived the MI targets as being less intelligent. Therefore, in contrast to Teachman and colleagues' (2003) findings with respect to obesity, the present study found that knowing someone who has had an MI was not related to perceptions of others who had an MI.

There are a few explanations for the differences found between the present study and Teachman and colleagues (2003). One explanation could be that the relationship between the participant and the individual who had an MI were not close. For example, many participants reported knowing their friend's grandfather or grandmother who had an MI, or a neighbour who had an MI. The relationships with these individuals may not be close enough to evoke empathy towards this health condition or perceptions of "same-group" status (Teachman et al., 2003). Therefore, closer relationships between the

participants and the individual who had an MI, such as a parent or spouse, may be necessary to evoke empathy towards individuals who have had an MI.

Another explanation for these findings may be that the samples being used in these studies differed. In Teachman and colleagues (2003), their sample consisted of individuals who voluntarily participated at a beach location (aged 17-78 years old), whereas the present sample consisted of university students whom mostly studied health-related degrees. Previous research has shown that individuals with more knowledge regarding a health condition (e.g., health-related students and health care professionals) tend to show less negative perceptions towards that health condition when compared to the general population (Katz et al., 1987). Therefore, it is possible that the students who reported knowing someone who had an MI was unrelated to the perceptions towards MI targets, because these students have been educated on MIs and did not let external experiences, such as knowing someone who had an MI, influence their perceptions.

Interestingly, although only a small effect size was found, the participants' familiarity with an MI was found to be negatively related with one personality variable (intelligent/unintelligent). So the participants more familiar with an MI perceived the MI targets as being unintelligent. This finding contradicted our hypothesis and may indicate that knowing someone who has had an MI can actually exacerbate negative perceptions towards MIs. In fact, a study by Puhl, Moss-Racusin, Schwartz, and Brownell (2008) found that overweight individuals experience the worst stigmatization at home with family members (e.g., parents, spouses and other relatives) or with friends. Puhl and colleagues (2008) were also surprised with these findings, as they anticipated close friends or relatives of a stigmatized person would be sympathetic and supportive, rather

than perpetuate the stigma. This study suggested that family members and friends tend to hold more negative perceptions because they believe that expressing criticism or negative attitudes may help to push or motivate individuals to alter their lifestyle (Puhl et al., 2008). Therefore, it is possible that a close relationship to an individual with a health condition can enhance negative perceptions.

Overall, the results suggest that simply knowing someone who has had an MI (rather than actually having had an MI) does not impact the perceptions formed of others who have had an MI, possibly because they do not feel they belong to this group (Taijfel & Turner, 1979). According to Taijfel and Turner (1979), individuals with similarities tend to identify with each other. Therefore, knowing someone that has had an MI does not lead to more positive perceptions of MIs overall, but experiencing an MI does. It is likely that experiencing an MI rather than knowing someone that has had an MI is key to feeling socially related to those that have had an MI. Sharing similar experiences likely provides individuals with a sense of belonging to this group, and a desire to improve the status of the group to which they feel they belong (Taijfel & Turner, 1979).

In regards to the second purpose of the MIF, no participants reported having an MI themselves. This was not unexpected given the sample that was used (i.e., young adults). Using a sample of middle or older aged adults may have been more suitable to answer this research question, as MIs more typically occur later in life (Thom et al., 2006). According to previous research (Faulkner et al., 2007; Martin Ginis et al., 2003; Taijfel & Turner, 1979; Teachman et al., 2003), if participants reported having experienced an MI themselves they would have perceived the MI targets more positively

than participants who did not have an MI, because they identify themselves with the target and instinctively increase the status of the target for the sake of self-presentation.

5.4 The Impact of Participant's Self-Classified Exercise Status on Impression Formation

The demographic questionnaire asked the participants to report their weekly average exercise frequency. Those who indicated engaging in one or more exercise session per week were considered exercisers and those who reported an average of no exercise sessions per week were considered non-exercisers. Approximately 90% of the participants indicated being exercisers and reported exercising 3-4 times per week on average. Similar to the MIF, these questions were asked to determine if the participant's self-classified exercise status influenced the impressions that were formed of other exercisers and non-exercisers. Although research is inconsistent, based on minimal support (Faulkner et al., 2007; Martin Ginis et al., 2003; Taijfel & Turner, 1979), it was hypothesized that participants who classified themselves as exercisers would perceive the exercising targets more favourably. Based on social identity theory (Taijfel & Turner, 1979), studies have suspected that exercisers would perceive other exercisers more favourably. This is because individuals who exercise may feel they belong to a group (i.e., of individuals who exercise) where they feel they have shared attributes that distinguish them collectively from other people (Martin Ginis et al., 2003). As a result, exercisers are more likely to perceive other exercisers positively in attempts to elevate the status of the group to which they believe they belong, thus increasing their own social status.

Few studies have investigated the influence of a participant's self-classified exercise status on the impressions they form of other exercisers. Little evidence has been found from these studies to suggest that self-classified exercisers have a positive bias towards other exercisers (Faulkner et al., 2007; Martin Ginis et al., 2003). Martin Ginis and colleagues (2003) and Lindwall and Martin Ginis (2006) found minimal support for the effects of self-classified exercise status, with only 3/20 dimensions indicating a positive relationship. Similarly, a study by Faulkner and colleagues (2007) found that participants' self-classified exercise status did not have a bias effect on how they perceived older adult exercisers. Inconsistent with these studies, the current study found that 2/30 variables had a negative bias. However, both of these correlations were very small (Cohen, 1988) and therefore revealed a weak relationship between the participant's self-classified exercise status and how they perceived MI targets who exercise. As a result, all of these studies provide little evidence to suggest that being a self-classified exerciser can influence the impressions of other exercisers compared to non-exercisers, and they fail to support the social identification theory tenet suggesting that individuals who are similar to other people tend to perceive those people favourably (implying that individuals who exercise should perceive other exercisers more favourably than non-exercisers).

One explanation for these findings may lie in how exercise status was determined. Martin Ginis and colleagues (2003), Faulkner and colleagues (2007) and the present study used a single item questionnaire that asked participants to indicate whether they exercised or not. Although some of the participants described themselves as engaging in exercise (or some sort of physical activity), it was left up to the participants to decide

what constituted exercise. It is possible that a more sophisticated measure of exercise behaviour may be necessary to reveal any possible biasing effects (e.g., International Physical Activity Questionnaire (IPAQ); Martin Ginis et al., 2004). The method of determining exercise participation employed here may be an inadequate source of information and be misinterpreted. For example, participants who indicated six hours of exercise per week may have considered casual walking to school as their exercise. However, that would have been taken as the equivalent (in terms of exercise status) of a participant who went to the gym for six hours a week. Although the individual may consider him/herself physically active, it may not be appropriate to classify this individual as an exerciser. According to Caspersen, Powell, and Christenson (1985), physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure (e.g., household activities, gardening). On the other hand, exercise has been classified as a subset of physical activity that is planned, structured, and repetitive and has a final objective for improvement or maintenance of physical fitness (Caspersen et al., 1985). So, even though walking is considered a form of exercise, it is possible that low intensity exercise does not influence the perceptions of other moderate or high intensity exercisers. Therefore, although it is consistent with previous research, the current method of obtaining exercise participation may not be an effective means for determining exercise status. More sophisticated questionnaires that delve into a variety of intensity levels (e.g., IPAQ) may be more useful.

Once again applying the social identity theory, the participants who exercise should have perceived the exercising targets more favourably rather than negatively. It is possible that the participant did not identify with the target because the target was also

described as having had an MI. The participants hence may not have felt an 'in-group' status and therefore perceived the target more negatively based on the MI.

Another explanation for these findings may be that impressions formed of exercisers is more affected by the participant's motivation to be seen as an exerciser rather than the actual act of exercising. Studies by Lindwall and Martin Ginis (2006, 2010) found that a participant's motivation to be seen as an exerciser (i.e., impression motivation) led to more positive impressions formed of female and male targets described as exercisers. This motivation is associated with the desire to create particular impressions in others' minds. However, there was only a small amount of evidence in these studies to support the idea that those who are motivated to be seen by others as exercisers perceive other exercisers more positively (Lindwall & Martin Ginis, 2006; Lindwall & Martin Ginis, 2010). Therefore, more research is required to determine if there is a relationship between being an exerciser and the perceptions of other exercisers.

5. 5 Limitations

As in all research, it is necessary to be conscious of the limitations of this study. Firstly, results of this study can only be generalized to university-aged students primarily in health-related fields. University students were used in this study to remain consistent with previous research examining the influence of exercise habit information on impression formation (Arbour et al., 2010; Drouin et al., 2008; Faulkner et al., 2007; Greenlees et al., 2007; Lindwall & Martin Ginis, 2006; Lindwall & Martin Ginis, 2010; Martin Ginis & Leary, 2006; Martin, Sinden, et al., 2000; Shields et al., 2007). The majority of the students in this sample indicated that they were in health-related degrees (75%), and most likely possessed more knowledge regarding MIs than the average

person. Consequently, the impressions that these students formed of individuals who have had an MI only represent a narrow scope of the perceptions that exist in society. Therefore, the use of other samples (e.g., older adults or non-health related students) may indicate different impressions or stereotypes held towards those who have had an MI. It is possible, for example, that older adults may have less negative perceptions of the MI-afflicted because they themselves feel at greater risk of having an MI compared to younger adults and are therefore more empathetic. A study by Greenlees and colleagues (2007) found that older adult participants rated older adult targets more favourably than young adult or middle-aged adult participants, indicating that older adults hold different perceptions than younger adults. The use of a more diverse sample may allow future researchers to explore the differing stereotypes towards MIs that exist across a society and to determine strategies (i.e., exercise) to alleviate these stereotypes.

Secondly, when determining whether the participants' self-classified exercise status influenced the impressions formed of exercising targets, the method of obtaining the participants exercise status was somewhat limited. The present study only asked the participant to report their frequency of physical activity and type of physical activity, but not whether the participants identified themselves as an exerciser. The questionnaire also queried physical activity rather than exercise, yet the targets in this study were described as exercisers. As a result, the method of obtaining exercise status in the present study may not be sufficient to determine whether the participants actually classify themselves as exercisers. It is possible that a more sophisticated method of obtaining the participants' exercise status (e.g., IPAQ), or assessing related variables such as the participants' motivation to be seen as an exerciser or assessing whether the participants identify

themselves as exercisers, would lead to more positive perceptions towards other exercisers. Future research should explore the relationship between such variables as the participants' exercise status, the participants' motivation to be seen as an exerciser, and the perceptions that participants form of other exercisers. It should be pointed out that although the questionnaire used in this study asked the participant to indicate the three types of exercise they typically participated in (to gauge the intensity of the individual's exercise), many participants did not adhere to the questionnaire guidelines and either left this section blank or filled in five to seven types of activities. Thus, the interpretation of this questionnaire was difficult to analyze. Other methods of obtaining exercise status should therefore be used in future studies.

Thirdly, given that the participants' explicit perceptions (i.e., openly held beliefs) toward the targets were assessed, it is possible that the reported data is subject to self-presentational biases. Participants may have consciously corrected their ratings to be more socially appropriate (Rusch et al., 2005). As a result, the participants may have given the targets overly positive ratings. It is also a concern whether the participants accurately completed the self-report questionnaires. Despite the fact participants were informed that all information and results would be kept confidential, strategic responses may have been provided in a further attempt to self-present (e.g., rating the MI targets more positively because it is a more socially acceptable attitude).

Fourth, it is possible that a specific detail (other than exercise status or health status) used in the target descriptions may have influenced impression formation. For example, being described as a high school history teacher or enjoying playing the guitar may have influenced impression formation. Although efforts were made to keep the

description of the targets neutral, it is possible that the specific detail chosen to describe the targets in this study may have positively or negatively influenced the participants' perceptions, regardless of the health status or exercise status.

Lastly, it is possible that perceptions of MIs exist beyond the characteristics in the ratings scale that were chosen in this study. The present study contained 21 personality and 10 physical characteristics in the target rating scale. However, perceptions towards individuals who have had an MI may extend beyond the limited characteristics chosen for the target scales in this study. For example, participants may perceive individuals who have had an MI as being uneducated or being egocentric, but these characteristics were not part of this study. Future research should consider using qualitative methods to obtain perceptions of others, as it may provide a more accurate indication of participants' perceptions.

5.6 Future Directions

Future research should consider examining the association between post-MI depression and negative stereotypes. It is possible that negative stereotypes held towards individuals who have had an MI may play a role in post-MI depression. For example, Teachman and colleagues (2003) found that stereotypes associated with obesity led to women experiencing depressive episodes and increased suicidal attempts. Additionally, negative impressions have been associated with withdrawal from social situations in fear of experiencing social rejection and isolation. Research has shown that social isolation is one of the risk factors for CAD symptoms and events such as an MI (Frasure-Smith et al., 2003). Therefore, it is possible that negative stereotypes associated with MIs can evoke negative emotions that result in depression. This is important because previous research

has indicated that MI patients frequently report feelings of depression following their hospitalization (Stern et al., 1976). Research has subsequently shown that the presence of depression following an MI can increase future morbidity and mortality rates (Frasure-Smith et al., 1995; Frasure Smith et al., 1999). For example, Frasure Smith and Lesperance (2003) found that MI patients who were depressed one week after an MI were three to four times more likely to die in the next six months when compared to MI patients who were not depressed. Interestingly, research has yet to determine the distinct cause(s) of post-MI depression. A study by Stern and colleagues (1976) found that MI patients described their depressive symptoms as a result of feeling damaged and less worthwhile in their own and other's eyes. Further, when people believe they are being perceived in undesirable ways, they may experience lowered self-esteem and increased depression (Martin, Leary et al., 2000). This is because it is common for individuals who are stigmatized by the public to self-stigmatize as well (Rusch et al., 2005). Therefore, it is possible that these depressive symptoms are a result of the MI patients feeling poorly about themselves (e.g., damaged and less worthwhile), rather than a lack of physical or functional recovery. Therefore, research should examine whether negative stereotypes held towards MI patients cause them to feel poorly about themselves and if these negative feelings are associated with post-MI depression. Future research should also consider examining self-perceptions of MI patients. It is possible that the perceptions MI patients have of themselves is a stronger predictor of post-MI depression than the perceptions that others hold of MI patients.

Since the present study suggests that people with health conditions (i.e., MIs and arthritis) are perceived more negatively than healthy individuals, future research should

also investigate why certain health conditions are perceived more negatively than others. It may be that health conditions that are perceived to be possibly preventable (e.g., MIs, diabetes, lung cancer and AIDS) may be perceived more negatively than health conditions that are perceived to be genetic or affect people at random.

5.7 Implications

Determining if stereotypes exist towards individuals with health conditions, such as an MI, is important, because negative stereotypes have been shown to reduce quality of life (Carstensen & Hartel, 2006; Teachman et al., 2003) and can influence how those individuals are treated (Snyder, 1992). For example, Jacoby (2002) found that stigmas towards epilepsy adversely impacted the patient's psychological well-being and quality of life. This study, along with others, found that quality of life is affected due to increased rates of psychopathology and reduced social interactions and social capital of those with stigmatized health conditions (Dell, 1986; Jacoby, 2002; Rusch et al., 2005; Teachman et al., 2003). Additionally, negative stereotypes have also been shown to affect the way that these individuals are treated (Jacoby, 2002; Rusch et al., 2005; Teachman & Brownell, 2001, Teachman et al., 2003). For example, studies have shown that individuals who are negatively stereotyped tend to receive a poorer quality of health care (Jacoby, 2002; Jacoby, Graham-Jones, & Baker, 1996; Teachman & Brownell, 2001). Studies have also shown that people who are stereotyped tend to refrain from seeking or fully participating in health care (Corrigan, 2004; Rusch et al., 2005). These consequences may be particularly important for individuals who have had an MI, given that they are already at a heightened risk because of their compromised health.

Negative stereotypes may also lead individuals to engage in specific behaviours that they believe are consistent with those stereotypes. For example, MI patients may refrain from participating in physical activity, as they attempt to behave consistently with the stereotype that MI patients are unfit and weak. Thus, engaging in behaviours that are consistent with stereotypes can potentially risk an individual's health (e.g., smoking), or even worsen health conditions that already exist.

Although this study had a relatively homogenous sample (mostly health-related students), it allowed us to make unique inferences. This is because a large percentage of the students in health-related degrees are likely to continue their education and career paths in health-related fields. Given that a large proportion of these students may eventually become health professionals (e.g., kinesiologists, nurses, doctors, chiropractors, physiotherapists, etc.), any negative stereotypes these students currently hold towards those who have had an MI could alter the care they provide to their patients. A study by Corrigan (2004) found that negative stereotypes held by health professionals towards patients affected the patients' desires to pursue treatment, and lead to the patients' failure to adhere to services as prescribed. They may also impact how health care professionals behave towards their patients. For example, a variety of studies have investigated the stereotypes and attitudes held by health care professionals towards obese patients (Maroney & Golub, 1992; Teachman & Brownell, 2001; Teachman et al., 2003; Schwartz, Chambliss, Brownell, Blair, & Billington, 2003). Teachman and Brownell (2001) found that health care professionals perceived obese patients as lazy, stupid and worthless. These perceptions can lead the professionals to blame the patient for his or her obesity, which can in turn influence the professionals' behaviour in both overt and subtle

ways (Teachman & Brownell, 2001). Specifically, factors such as empathy, time spent with patients, quality of interactions, optimism about improvement, and willingness to provide support were negatively affected for the obese patients. Therefore, reducing the negative stereotypes held towards MI patients is not only important in the general public, but efforts should also be made to remove the stereotypes held by health care professionals and health-related students.

Not only did the present study reveal that negative stereotypes exist towards individuals who have had an MI, it also showed that exercise can be effective as a strategy to alleviate these negative perceptions. Given that exercise can help promote positive perceptions for those who have had an MI, it may be used to motivate these individuals to engage in exercise. Therefore, MI patients may increase their exercise behaviours in attempt to be seen favourably by others and reduce negative perceptions that are held towards MIs. Not only will these exercisers reap the self-presentational benefits associated with being an exerciser, but they will also reap the physical and health benefits associated with exercise (Fletcher et al., 1996), such as reducing future cardiac events. On the other hand, individuals who have had an MI need to be cautious about revealing non-exercising behaviours, as this can worsen the already negative perceptions towards MIs. Patients should therefore avoid sedentary behaviours in order to protect their social status and help create more favourable impressions. Consistent with previous research (Martin, Sinden, et al., 2000), non-exercising behaviours should be avoided, because it places these individuals at risk to encounter self-presentational liabilities (e.g., being seen as unattractive, less friends). Thus, combining inactivity with an MI enhances negative perceptions held by others.

It is important to identify stereotypes that exist towards MIs so that strategies that can be developed to reduce or eliminate these stereotypes. Research to date shows that changing negative stereotypes or stigmas is a difficult process. Teachman and colleagues (2003) suggested two strategies: manipulating beliefs and evoking empathy. This study indirectly looked at the application of these strategies for reducing stigmas for obesity (Teachman et al., 2003). Teachman and colleagues (2003) found that participants who reported having a greater understanding of what it is like to be obese and being obese themselves exhibited less stigma compared to participants who did not report having an understanding of what it is like to be obese. The authors believed that the use of interventions that enhance personal appreciation of the experiences of obese individuals is useful in changing attitudes (Teachman et al., 2003). Using Teachman and colleagues (2003) approach, strategies to manipulate beliefs and evoke empathy could be used to reduce negative perceptions towards individuals who have had an MI. For instance, implementing educational seminars for health-care professionals and family and friends of those who have had an MI may help reduce any negative perceptions or attitudes towards MIs. This can help ameliorate any incorrect beliefs about individuals who have had an MI and attempt to create more favourable perceptions. These inexpensive strategies can go a long way toward improving healthcare and can lessen the social exclusion experienced by people who have had an MI. Therefore, education and awareness programs can be implemented in schools (especially in health-related degrees) and in the social media to help prevent the instinctive, exaggerated mental imagery that occurs when people stereotype individuals who have had an MI.

5.8 Conclusions

The present study found that university-aged students from primarily health-related degrees perceived individuals who have had an MI negatively, particularly on physical characteristics, when compared to individuals who had arthritis or no health condition (controls). These results indicate that stereotypes towards MIs revolve around physical appearance rather than personality traits.

In order to reduce these perceptions, the present study found that exercise behaviours can be used to alleviate the negative stereotypes towards MIs. This study was one of the first studies to determine that exercise information can actually reduce negative stereotypes in special populations to such an extent that they are rated more similarly to the general population. This is in line with the positive exerciser stereotype hypothesis (Martin Ginis et al., 2003), suggesting that exercisers are perceived more positively than non-exercisers and controls. While the positive exerciser stereotype was found to emerge in this study, it is important to note that this stereotype did not emerge to the same extent as previous studies (Drouin et al., 2008; Greenlees et al., 2007; Lindwall & Martin Ginis, 2006; Lindwall & Martin Ginis, 2010; Martin Ginis et al., 2003; Martin, Sinden, et al., 2000). The positive perceptions towards individuals who exercise following an MI were directed towards characteristics related to fitness rather than physical attractiveness, whereas previous research has found that exercisers (with no health condition) are perceived more positively on both physical characteristics and personality characteristics that were completely unrelated to physical activity (e.g., being kind, good looking, etc.). Therefore, the positive exerciser stereotype appears to promote stronger positive perceptions in healthy populations compared to unhealthy populations (i.e., MI patients).

The present study also found that a negative non-exercising stereotype emerged, suggesting that presenting sedentary behaviour information to others can exacerbate negative stereotypes associated with having an MI. In support of this claim, the present study found that the exercise controls (MI targets with no exercise habits mentioned) were rated more favourably than the non-exercising target on several of the physical and personality characteristics. Accordingly, it may be useful to encourage individuals who have had an MI to engage in exercise not only for the health benefits but also for the self-presentational benefits of being an exerciser.

Overall, it was determined that negative stereotypes exist in today's society towards individuals who have had an MI. Efforts to reduce these negative perceptions are therefore necessary for the overall health and well-being of these individuals. Preliminary evidence of the present study suggested that exercise may be an effective strategy to help alleviate the negative stereotypes towards individuals who have had an MI. Not only will exercise help promote positive perceptions, its other benefit is the obvious prevention of future cardiac events (e.g., strengthening arteries and heart muscle). More research is required to identify other coping mechanisms or strategies that can be used by those who have had an MI to overcome negative perceptions. Lastly, education and awareness regarding health conditions, such as MI, obesity, epilepsy, diabetes, should be implemented for health-related students and the general public to help prevent negative stereotypes and stigmatisations. A breadth of knowledge regarding MIs will help reduce the tendency for ungrounded judgements and promote more accurate perceptions based on insightful pieces of information about the health condition (Smith & Mackie, 2007).

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APPENDIX A

Announcement Script

Hello everyone,

My name is Miranda and I am a graduate student in the faculty of Applied Health Sciences. I am currently conducting my thesis project with Professor Gammage on "University students' beliefs of others". This study has received clearance form the Brock University REB (File #12-291). I am currently looking for female and male participants 17 years and older to participate in my study. This study is a one time session that will consist of a small package of questionnaires (one paragraph and 3 short questionnaires). Participation in this study will take approximately 10-15 minutes of your time. If you are interested in participating, please contact me at mc09kp@brocku.ca. Thank you for your time!

APPENDIX B

Research Participants Wanted

Examining university students' beliefs of others

Who is eligible?

- Female and male university students
- Aged 17-25 years

What?

- One visit lasting approximately 10-15 minutes
- Complete one questionnaire package consisting of a short paragraph and 3 questionnaires

Contact: Miranda Cloudt, FAHS, Brock University mc09kp@brocku.ca or Dr. Kimberley Gammage, FAHS, Brock University, kgammage@brocku.ca

This study has received ethics clearance through Brock University Research Ethics Board (REB File:# 12-291)

Beliefs of others study Miranda mc09kp@brocku.ca Dr. Gammage, kgammage@brocku.ca	Beliefs of others study Miranda mc09kp@brocku.ca Dr. Gammage, kgammage@brocku.ca	Beliefs of others study Miranda mc09kp@brocku.ca Dr. Gammage, kgammage@brocku.ca	Beliefs of others study Miranda mc09kp@brocku.ca Dr. Gammage, kgammage@brocku.ca	Beliefs of others study Miranda mc09kp@brocku.ca Dr. Gammage, kgammage@brocku.ca	Beliefs of others study Miranda mc09kp@brocku.ca Dr. Gammage, kgammage@brocku.ca	Beliefs of others study Miranda mc09kp@brocku.ca Dr. Gammage, kgammage@brocku.ca

APENDIX C

Demographic Questionnaire

Age: _____

Gender: _____

Major: _____

Academic Year:_____

Height: _____ Weight: _____

How many times per week do you exercise, on average? _____

On average, how long is your typical exercise session? _____

Please check up to 3 primary exercise activities that you normally engage in:

☐ Running or jogging
☐ Weight lifting
☐ Individual sports
☐ Team sports
☐ Cycling
☐ Yoga, Pilates or other mind-body activities
☐ Swimming
☐ Walking
☐ Dance
☐ Cardiovascular equipment (e.g., treadmill, bike, elliptical, etc)
☐ Martial arts (e.g., karate, kickboxing)
☐ Group fitness classes (e.g., step, boot-camp, circuit)
☐ Other (specify):_____

APPENDIX D

Target Descriptions

Healthy Control Target (No health condition, no mention of exercise):

(Mary/John) has brown eyes and short brown hair. (She/He) is a former high school history teacher and is currently going through a career change. (She/he) has lived in (her/his) home for 5 years now with (her/his) spouse but their three grown-up children have all moved out. Two of (her/his) daughters moved out of the country for work, while the youngest son stayed in the area to be near his family. In (Mary/John)'s spare time (she/he) likes to read the newspaper, play the guitar, and spend time with (her/his) family and friends. (Mary/John) also likes to travel.

Arthritis Target (no mention of exercise):

(Mary/John) has brown eyes and short brown hair. (She/He) is a former high school history teacher and is currently going through a career change. (She/he) has lived in (her/his) home for 5 years now with (her/his) spouse but their three grown-up children have all moved out. Two of (her/his) daughters moved out of the country for work, while the youngest son stayed in the area to be near his family. In (Mary/John)'s spare time (she/he) likes to read the newspaper, play the guitar, and spend time with (her/his) family and friends. (Mary/John) also likes to travel. Mid-summer (Mary/John) was diagnosed with rheumatoid arthritis and received treatment to reduce pain and joint inflammation. (He/She) is now continuing treatment at home.

MI Target/Exercise Control Target(no mention of exercise):

(Mary/John) has brown eyes and short brown hair. (She/He) is a former high school history teacher and is currently going through a career change. (She/he) has lived in (her/his) home for 5 years now with (her/his) spouse but their three grown-up children have all moved out. Two of (her/his) daughters moved out of the country for work, while the youngest son stayed in the area to be near his family. In (Mary/John)'s spare time (she/he) likes to read the newspaper, play the guitar, and spend time with (her/his) family and friends. (Mary/John) also likes to travel. Mid-summer (Mary/John) had a heart attack and was brought to the hospital for cardiac treatment. After undergoing treatment, (she/he) returned home for recovery.

MI Exerciser Target:

(Mary/John) has brown eyes and short brown hair. (She/He) is a former high school history teacher and is currently going through a career change. (She/he) has lived in (her/his) home for 5 years now with (her/his) spouse but their three grown-up children have all moved out. Two of (her/his) daughters moved out of the country for work, while the youngest son stayed in the area to be near his family. In (Mary/John)'s spare time (she/he) likes to read the newspaper, play the guitar, and spend time with (her/his) family and friends. (Mary/John) also likes to travel. Mid-summer (Mary/John) had a heart attack and was brought to the hospital for cardiac treatment. After undergoing treatment, (she/he) returned home for recovery. (She/he) now works out at the gym about 3-4 times a week, and these exercises generally consist of walking, stretching, and some weight training.

MI Non-exerciser Target:

(Mary/John) has brown eyes and short brown hair. (She/He) is a former high school history teacher and is currently going through a career change. (She/he) has lived in (her/his) home for 5 years now with (her/his) spouse but their three grown-up children have all moved out. Two of (her/his) daughters moved out of the country for work, while the youngest son stayed in the area to be near his family. In (Mary/John)'s spare time (she/he) likes to read the newspaper, play the guitar, and spend time with (her/his) family and friends. (Mary/John) also likes to travel. Mid-summer (Mary/John) had a heart attack and was brought to the hospital for cardiac treatment. After undergoing treatment, (she/he) returned home for recovery. (Mary/John) does not currently participate in any physical activities such as walking, stretching, or weight training.

APPENDIX E

Target Ratings

Based on the paragraph you have just read, please rate the individual described on the following characteristics, by circling the appropriate number:

1. Mean	1	2	3	4	5	6	7	8	9	**Kind**
2. Few friends	1	2	3	4	5	6	7	8	9	**Many friends**
3. Lazy	1	2	3	4	5	6	7	8	9	**Works hard**
4. Afraid	1	2	3	4	5	6	7	8	9	**Brave**
5. Unintelligent	1	2	3	4	5	6	7	8	9	**Intelligent**
6. Sloppy	1	2	3	4	5	6	7	8	9	**Neat**
7. Sad	1	2	3	4	5	6	7	8	9	**Happy**
8. Lacks self-confidence	1	2	3	4	5	6	7	8	9	**Has self-confidence**
9. Lacks self-control	1	2	3	4	5	6	7	8	9	**Has self-control**
10. Unsociable	1	2	3	4	5	6	7	8	9	**Sociable**
11. Dependent	1	2	3	4	5	6	7	8	9	**Independent**
12. Not friendly	1	2	3	4	5	6	7	8	9	**Friendly**
13. Passive	1	2	3	4	5	6	7	8	9	**Persevering**
14. Incompetent	1	2	3	4	5	6	7	8	9	**Competent**
15. Self-Pitying	1	2	3	4	5	6	7	8	9	**Not self-pitying**
16. Gives up easily	1	2	3	4	5	6	7	8	9	**Persistent**
17. Helpless	1	2	3	4	5	6	7	8	9	**Self-Reliant**
18. Calm	1	2	3	4	5	6	7	8	9	**Angry**
19. Optimistic	1	2	3	4	5	6	7	8	9	**Pessimistic**
20. Health-conscious	1	2	3	4	5	6	7	8	9	**Not health-conscious**
21. Stressed	1	2	3	4	5	6	7	8	9	**Not stressed**
22. Ugly	1	2	3	4	5	6	7	8	9	**Good-looking**
23. Sexually unattractive	1	2	3	4	5	6	7	8	9	**Sexually attractive**
24. Overweight	1	2	3	4	5	6	7	8	9	**Underweight**
25. Scrawny	1	2	3	4	5	6	7	8	9	**Muscular**
26. Physically Sickly	1	2	3	4	5	6	7	8	9	**Physically healthy**
27. Has an unattractive figure	1	2	3	4	5	6	7	8	9	**Has an attractive figure**
28. Unfit	1	2	3	4	5	6	7	8	9	**Fit**
29. Physically weak	1	2	3	4	5	6	7	8	9	**Physically strong**
30. Physically limited	1	2	3	4	5	6	7	8	9	**Physically liberated**
31. Frail	1	2	3	4	5	6	7	8	9	**Sturdy**

APPENDIX F

MIF

Have you ever had a heart condition?

☐ ☐

Yes **No**

Do you know anyone (e.g. family or friend) that has ever had a heart condition?

☐ ☐

Yes **No**

If answered **yes** to any of the above questions:

Please indicate the relationship of the person and specify the type of heart condition (see below for a list of cardiac conditions):

Relationship:	**Heart Condition (if known):**
Example: My sister	Cardiac Arrhythmia

Cardiac Conditions

- Cardiac Arrhythmia (e.g. atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
- Heart failure
- Coronary artery disease
- Valvular heart disease (e.g. aortic and mitral stenosis, aortic or mitral regurgitation)
- Heart attack (myocardial infarction)
- Aortic Aneurysms
- Irregular heart beats
- Hypertension (high blood pressure)
- High cholesterol
- Deep vein thrombosis
- Endocarditis
- Bypass
- Heart transplant
- Other (please specify)

APPENDIX G

Ethics Clearance

Brock University
Research Ethics Office
Tel: 905-688-5550 ext. 3035
Email: reb@brocku.ca

Social Science Research Ethics Board

Certificate of Ethics Clearance for Human Participant Research

DATE:	7/12/2013		
PRINCIPAL INVESTIGATOR:	GAMMAGE, Kimberley Kinesiology		
FILE:	12-291 - GAMMAGE		
TYPE:	Masters Thesis/Project	STUDENT: SUPERVISOR:	Miranda Cloudt Kimberley Gammage

TITLE: University Students' Beliefs of Others

ETHICS CLEARANCE GRANTED

Type of Clearance: NEW Expiry Date: 7/31/2014

The Brock University Social Sciences Research Ethics Board has reviewed the above named research proposal and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement. Clearance granted from 7/12/2013 to 7/31/2014.

The Tri-Council Policy Statement requires that ongoing research be monitored by, at a minimum, an annual report. Should your project extend beyond the expiry date, you are required to submit a Renewal form before 7/31/2014. Continued clearance is contingent on timely submission of reports.

To comply with the Tri-Council Policy Statement, you must also submit a final report upon completion of your project. All report forms can be found on the Research Ethics web page at http://www.brocku.ca/research/policies-and-forms/research-forms.

In addition, throughout your research, you must report promptly to the REB:

a) Changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) All adverse and/or unanticipated experiences or events that may have real or potential unfavourable implications for participants;
c) New information that may adversely affect the safety of the participants or the conduct of the study;
d) Any changes in your source of funding or new funding to a previously unfunded project.

We wish you success with your research.

Approved:

_____
Jan Frijters, Chair
Social Sciences Research Ethics Board

Note: Brock University is accountable for the research carried out in its own jurisdiction or under its auspices and may refuse certain research even though the REB has found it ethically acceptable.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of research at that site.

APPENDIX H

Informed Consent

Title of Study: University students' beliefs about others

Principal Investigator: Kimberley L. Gammage, Associate Professor, Department of Kinesiology, Brock University, 905-688-5550 ext. 3772; kgammage@brocku.ca

Student-Investigators: Miranda Cloudt, Master's Student, Faculty of Applied Health Science, Brock University

INVITATION

You are invited to participate in a study that involves research. The purpose of this study is to investigate the beliefs that university student's hold of others. This study is interested in determining how participants rate others on a variety of personality and physical dimensions. Should you choose to participate, you will be asked to read a short paragraph and fill out a series of questionnaires.

WHAT'S INVOLVED

Participation in this study will consist of a one-time testing session lasting approximately 10-15 minutes. You will receive a demographic questionnaire, one description of a person and then be asked to rate this person on a variety of personality and physical dimensions. Questionnaire packages will be completed individually, although you may be in a small-group setting.

POTENTIAL BENEFITS AND RISKS

Although there is no direct benefits associated with participating in this study, you will be contributing to the scientific community as we better understand the types of beliefs that university students hold of other individuals. There are no risks associated with participation in this study. There are no known instances of any problems resulting from anyone completing these questionnaires. If you do experience any concerns, you may contact Dr. Gammage at the above number or email.

CONFIDENTIALITY

All information you provide is considered confidential and anonymous; your name will not be included or, in any other way, associated with the data collected in the study. Data collected during this study will be stored in a locked filing cabinet in a locked storage room on campus. Data will be kept for 5 years following publication of results of the study, after which time all data will be destroyed. Access to this data will be restricted to the investigators listed above and their student research assistants.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions in the questionnaires of the study. Further, you may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled. If you would like to withdraw from the present study you may either hand in an empty questionnaire package or verbally inform the researcher that you do not want to participate. Once the questionnaire package has been handed in to the researcher, participants can no longer withdraw their responses. Participants are anonymous and we can no longer identify your questionnaire package.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available following completion of all participants. You may receive a summary of the results of the study via email or regular mail, as requested, by completing the request for feedback form. At this time, you may contact us with any questions you may have about the interpretation of results.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact the Principal Investigator using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (File #12-291). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Thank you for your assistance in this project. Please keep a copy of this form for your records.

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time. By returning the questionnaire package, I understand that I am giving my consent to participate in this study.

APPENDIX I

Debriefing Script

In this study we are examining university student's perceptions of myocardial infarction patients. We are also examining whether describing an individual who has had a myocardial infarction as an exerciser can help promote positive perceptions. There were 10 different questionnaire packages that contain different descriptions of the target that you were asked to rate. The target descriptions had modifications to the targets gender (male/female), health status (has had an MI/arthritis/healthy individual) and exercise status (exerciser/non-exerciser/control). All participants were asked to rate one of the 10 target descriptions on the same rating scales. In order to obtain natural perceptions, we could not reveal the true purpose of the study until the completion of the questionnaires. We please request that you will conceal the true purpose of the study in order to prevent compromised results from our future participants. Do you have any questions regarding the current study?

APPENDIX J

Brock University, Faculty of Applied Health Sciences
Summary of Results Request Form

Title of Study: University Students' Perceptions of Myocardial Infarction

Principal Investigator: Dr. Kimberley Gammage, Associate Professor, Department of Kinesiology, Brock University

Principal Student Investigator: Miranda Cloudt, M.Sc. Candidate, Faculty of Applied Health Sciences, Brock University

If you would like to receive a summary of the study's results, please complete the following information:

Name:
_____

E-mail Address:
_____

If you would like to receive the information by mail, please provide your name and address:

Name:
_____
(First) (Last)

Address:
_____
(Street Number) (Street)

_____
(City) (Province) (Postal Code)